

**LIBBY ASBESTOS SUPERFUND SITE,
OPERABLE UNIT 3**

DATA SUMMARY REPORT: 2007 TO 2013

Tables

This page intentionally left blank to facilitate double-sided printing.

TABLE 1-1. SUMMARY OF SAMPLES COLLECTED AND ANALYZED FROM 2007 TO 2013 FOR OU3

Panel A: Asbestos

Phase	Description	Completed In Year	Total Number of Samples ^a	Air ABS	Ambient Air	Ash	Duff	Forest Soil	Ground-water	Mine Waste	Pore Water	Sediment	Surface Water	Soil	Tree Bark	Tree Core
I	Phase I	2007	351		32		73	74		38		24	24		74	12
IIA	Phase II Part A	2008	325									116	209			
IIB	Phase II Part B	2008	79		65				14							
IIC	Phase II Part C	2008	14									12	2			
III	Phase III	2009	227	227												
IVA	Phase IV Part A	2010	256	252											4	
IVB	Phase IV Part B	2011	82										82			
AMP	Ampitheater Removal	2012	6											6		
CL	Commercial Logging	2012	23	13			5								5	
VA	Phase V Part A	2012	78	2								4	72			
VB	Phase V Part B	2012	210								47	54	109			
AMP	Ampitheater Removal	2013	9											9		
VB	Phase V Part B	2013	78								38		40			
FIRE	Souse Gulch Fire	2013	21	18		3										
	Total Asbestos Results		1,759	512	97	3	78	74	14	38	85	210	538	15	83	12

Panel B: Non-asbestos

Phase	Description	Completed In Year	Total Number of Samples ^a	Air ABS	Ambient Air	Ash	Duff	Forest Soil	Ground-water	Mine Waste	Pore Water	Sediment	Surface Water	Soil	Tree Bark	Tree Core
I	Phase I	2007	98					12		38		24	24			
IIA	Phase II Part A	2008	164									108	56			
IIB	Phase II Part B	2008	13						13							
IIC	Phase II Part C	2008	14									12	2			
III	Phase III	2009	0													
IVA	Phase IV Part A	2010	0													
IVB	Phase IV Part B	2011	0										b			
CL	Commercial Logging	2012	0													
VA	Phase V Part A	2012	0													
VB	Phase V Part B	2012	12									12				
	Total Non-Asbestos Results		301	0	0	0	0	12	13	38	0	156	82	0	0	0

^a Excludes field and laboratory QC samples/analyses

^b Field-based water quality measurements only

Notes:

ABS = activity-based sampling

QC = quality control

TABLE 1-2. SUMMARY OF OU3 SAP/QAPPs AND DOCUMENT MODIFICATIONS (2007-2013)

Libby Asbestos Superfund Site

Phase	Applicable SAP or QAPP (see references)	LFM Form No.	Creation Date	Description	EPA Approval Date
Phase I EPA (2007) Rev 0 - 9/26/2007	Phase I LFM-OU3-01	10/5/2007	Figure 5-1, Table 5-2, and Attachment E: Mine waste sampling locations identified with the prefix MS- rather than MW-.	10/12/2007	
	Phase I LFM-OU3-02	10/5/2007	pH to be checked and additional preservative to be added as needed to achieve the target pH level.	10/12/2007	
	Phase I LFM-OU3-03	10/17/2007	Table 6-3: Laboratory performed the LECO method for TOC in soils.	11/7/2007	
	Phase I LFM-OU3-04	10/19/2007	Sample preparation modified to prep the samples on an as received basis for the TOC, Fluoride, and paste pH test methods.	11/7/2007	
	Phase I LFM-OU3-05	11/2/2007	Section 6.2.1 and 6.2.2: Lists of compounds replaced with the petroleum hydrocarbons with State of Montana risk-based screening levels under their Tier 1 risk-based corrective action evaluation process for petroleum hydrocarbon releases.	11/6/2007	
	Phase I LFM-OU3-06	12/6/2007	Section 7.3.1: All soil samples prepared in accordance with ISSI-Libby-01 (Rev 10).	12/6/2007	
	Phase I LFM-OU3-07	11/30/2007	Index ID of a soil sample changed from P1-00401 to P1-00400.	12/6/2007	
	Phase I LFM-OU3-08	12/11/2007	Surface water sample collected on 10/13/07 at Station ID TP was to be re-sampled by Matt Young and John Garr of MWH on 12/12/07 at the same location.	12/12/2007	
	Phase I LFM-OU3-09	11/20/2008	Change in drying blank insertion frequency for duff samples: one drying blank/drying day to one drying blank/ten drying batches.	11/21/2008	
	Phase I LFM-OU3-10	9/7/2011	Archived samples for a subset of the forest soils collected in 2007 for the analysis of metals to provide site-specific data on metal concentrations in soils that are representative of reference conditions.	9/13/2011	
	Phase I LFM-OU3-11	11/4/2011	Assigned data qualifiers to duff concentrations for subset of samples collected in Phase I.	11/4/2011	
Phase II, Part A EPA (2008a) Rev 1 - 5/29/2008 Rev 0 - 3/20/2008	Phase IIA LFM-OU3-01	5/9/2008	Field quality control samples increased to one duplicate and one split sample at tailings impoundment (TP) and the Mill Pond (MP) for each weekly sampling event. Samples submitted for rapid turnaround time analysis.	5/9/2008	
	Phase IIA LFM-OU3-02	6/19/2008	Section 6.1.1: TEM stopping rules for water analyses modified based on laboratory input to allow for faster analysis completion. The maximum LA structures stopping rule reduced from 50 structures to 25 structures.	6/19/2008	
	Phase IIA LFM-OU3-03	6/19/2008	1. Section 5.1.1: Additional dredge sediment sample collected from each pond and tailings impoundment (TP) to investigate differences in collection methods. 2. Prioritize sediment analyses in samples with limited mass.	6/19/2008	
	Phase IIA LFM-OU3-04	7/7/2008	2008 sampling event, Element 1: Performance evaluation samples (PE) for non-asbestos analysis sent from the QATS contractor to the non-asbestos analytical laboratory for preparation.	7/15/2008	
	Phase IIA LFM-OU3-05	9/3/2008	1. Section 8.3.2: Selection of laboratory duplicates for preparation and analysis included samples from all solid media and samples from each PLM-VE bin. 2. Section 8.3.2: Samples selected for laboratory duplicate analysis also submitted for interlab analysis.	9/3/2008	
	Phase IIA LFM-OU3-06	7/15/2008	Section 5.2: Defined the sampling dates for the Kootenai River Monitoring.	7/15/2008	
	Phase IIA LFM-OU3-07	7/17/2008	To prevent the opening of sediment sample containers during transit, corrective actions were taken.	8/8/2008	
	Phase IIA LFM-OU3-08	9/15/2008	Section 6.2.1, Section 6.2.2: MDEQ screening limits for total EPH revised.	9/15/2008	
	Phase IIA LFM-OU3-09	9/15/2008	Frequency of laboratory duplicates/interlabs for sediment samples increased from 10% to 15%.	9/15/2008	
	Phase IIA LFM-OU3-10	11/7/2008	Section 7: Additional asbestos analyses of water samples.	11/7/2008	
Phase II, Part B EPA (2008) Rev 0 - 7/2/2008	Phase IIB LFM-OU3-01	7/15/2008	Section 4.3.3: Monitoring event for groundwater changed from the week of August 18, 2008 to the week of July 14, 2008.	7/15/2008	
	Phase IIB LFM-OU3-02	9/15/2008	In sections 6.2.1 and 6.2.2: The MDEQ screening limits for total EPH were revised.	9/15/2008	
	Phase IIB LFM-OU3-03	11/17/2008	Section 6.1.3: The TEM stopping rules for water analyses modified based on laboratory input to allow for faster analysis completion.	signed not available	
Phase II, Part C	EPA (2008c) Rev 0 - 9/17/2008	Phase IIC LFM-OU3-01	11/21/2008	Modified TEM stopping rules for sediment porewater collected during sediment toxicity tests.	11/21/2008

TABLE 1-2. SUMMARY OF OU3 SAP/QAPPs AND DOCUMENT MODIFICATIONS (2007-2013)

Libby Asbestos Superfund Site

Phase	Applicable SAP or QAPP (see references)	LFM Form No.	Creation Date	Description	EPA Approval Date
Phase III	EPA (2009b) Rev 2 - 11/22/2010 Rev 1 - not specified Rev 0 - 5/26/2009	Phase III LFM-OU3-01	7/1/2009	Revised script for activity-based sampling.	7/1/2009
		Phase III LFM-OU3-02	7/13/2009	Flow rates measured only at the beginning and end of the forest script and at the beginning and end of the wood-burning activity.	7/13/2009
		Phase III LFM-OU3-03	7/15/2009	Revised FSDS for activity-based sampling personal air monitoring.	7/15/2009
		Phase III LFM-OU3-04	7/24/2009	ABS script modified to collect separate samples during the ATV riding activity and other activities.	7/24/2009
		Phase III LFM-OU3-05	8/31/2009	1. Modifications to script for activity-based sampling. 2. Modifications to stopping rules for asbestos analysis. 3. Modifications to sample handling procedures.	9/1/2009
		Phase III LFM-OU3-06	8/28/2009	SOP MAMMAL-LIBBY-OU3 (Rev.1) Section 4.10: Procedure for disinfecting vials containing small mammal tissues added.	9/1/2009
		Phase III LFM-OU3-07	8/26/2009	FSDS for ABS personal air monitoring revised to be consistent with latest revision of the ABS script.	9/4/2009
Phase IV, Part A	EPA (2010a) Rev 0 - 6/14/2010 Addendum: Rev 0 - 8/20/2011	Phase IVA LFM-OU3-01	7/15/2010	1. Section 5: ABS performed in accord with the revised ABS scripts. Samples handled in accord with ABS-LIBBY-OU3. 2. Section 7: No rinsate blanks necessary. Total of 5 field blanks collected for Scenarios 1-5. 3. Section 4.5.6: Additional "ultra-low" flow pump.	7/16/2010
		Phase IVA LFM-OU3-02	7/26/2010	Decreased duration of many ABS activities to prevent overloading.	7/30/2010
		Phase IVA LFM-OU3-03	9/16/2010	Incorporated indirect preparation of selected samples.	9/16/2010
		Phase IVA LFM-OU3-04	10/1/2010	1. Changed the number of personal breathing zone samples and perimeter samples in ABS Script 4. 2. Specified the target pump flow rates. 3. Clarified the details of the script.	10/5/2010
		Phase IVA LFM-OU3-05	11/4/2011	Assign data qualifiers to reported tree bark surface loading estimates for slash pile samples.	11/4/2011
Phase IV, Part B	EPA (2011a) Rev 0 - 4/4/2011	Phase IVB LFM-OU3-01	4/13/2011	1. Water samples collected using direct collection methods. 2. Modified field-filtered sample shipping and archive procedures. 3. All asbestos EDDs transmitted to EPA contractors electronically.	4/13/2011
		Phase IVB LFM-OU3-02	10/18/2011	Increased data verification from 10% to 20% for all surface water samples.	10/18/2011
		Phase IVB LFM-OU3-03	11/8/2011	Section 5.1: Grid preparation procedures revised.	signed not available
Amphitheater Removal	MWH (2012) Rev 0 - 9/12/2012	NA	NA	NA	NA
Commercial Logging	EPA (2012c) Rev 0 - 9/17/2012	Commercial Logging LFM-OU3-01	8/20/2012	"Site preparation for re-planting" replaced with "Site restoration".	8/28/2012
		Commercial Logging LFM-OU3-02	8/23/2012	Text changed to correct error in sampling duration used in TEM stopping rule.	8/28/2012
		Commercial Logging LFM-OU3-03	10/11/2012	Selection criteria applied for each pair of high volume and low volume filters to determine which filters should be analyzed.	10/11/2012
Phase V, Part A	EPA (2012d) Rev 2 - 10/12/2012 Rev 1 - 5/22/2012 Rev 0 - 4/17/2012	Phase VA LFM-OU3-01	4/30/2012	Higher target analytical sensitivity for the rapid TEM analysis of water to improve sample turn-around time.	5/1/2012
		Phase VA LFM-OU3-02	5/15/2012	Sampling station "KR-5" added to the third round of weekly Kootenai bank sampling to evaluate mixing vs. segregation.	5/15/2012
		Phase VA LFM-OU3-03	7/16/2012	All TEM analyses utilized LB-000066d rather than LB-000066c to decrease the number of micrographs.	7/19/2012
		Phase VA LFM-OU3-04	1/18/2013	Data verification frequencies revised.	1/18/2013
Phase V, Part B	EPA (2012b) Rev 2 - 7/20/2012 Rev 1 - 5/22/2012 Rev 0 - 4/20/2012	Phase VB LFM-OU3-01	5/1/2012	Noisy Creek used as the offsite reference area for the trout studies.	5/3/2012
		Phase VB LFM-OU3-02	5/15/2012	Due to heavy sediment load, sample allowed to settle for 15 minutes to allow larger particles to fall out of suspension.	5/15/2012
		Phase VB LFM-OU3-03	7/16/2012	All TEM analyses utilized LB-000066d rather than LB-000066c to decrease the number of micrographs.	7/19/2012
		Phase VB LFM-OU3-04	8/6/2012	Mill Pond used as source for collecting fish for tissue burden analysis of LA instead of the Tailings Pond.	8/17/2012
		Phase VB LFM-OU3-05	9/13/2012	Section 4.1.5: Histopathology performed for the metamorphosed specimens for both the Tree Frog and Columbia Spotted Frog.	10/10/2012
Phase V, Part B Addendum	EPA (2013b) Rev 0 - 4/3/2013	Phase VB LFM-OU3-01	5/21/2013	20% of sediment porewater and surface water samples collected during 2013 eyed egg study re-prepared by EMSL-Cinnaminson.	5/21/2013

TABLE 1-2. SUMMARY OF OU3 SAP/QAPPs AND DOCUMENT MODIFICATIONS (2007-2013)*Libby Asbestos Superfund Site*

Phase	Applicable SAP or QAPP (see references)	LFM Form No.	Creation Date	Description	EPA Approval Date
Wildfire Contingency Plan	EPA (2014) Rev 2 - 6/13/2014 Rev 1 - 8/28/2013 Rev 0 - 8/7/2012	NA	NA	NA	NA

Notes:

% - percent	ID - identification	MDEQ - Montana Department of Environmental Quality
ABS - activity-based sampling	LA - Libby amphibole asbestos	PLM-VE - polarized light microscopy - visual area estimation
ATV - all-terrain vehicle	LFM - Libby field modification	QAPP - quality assurance project plan
CDM Smith - CDM Federal Programs Corp.	MP - Mill Pond	QATS - quality assurance technical support
EDD - electronic data deliverable	MWH - MWH Americas, Inc.	SAP - sampling and analysis plan
EMSL - EMSL Analytical, Inc.	NA - not applicable	SOP - standard operating procedure
EPA - Environmental Protection Agency	No. - number	TEM - transmission electron microscopy
EPH - extractable petroleum hydrocarbons	OU3 - operable unit 3	
FSDS - field sampling data sheet	PE - performance evaluation	

TABLE 2-1. PHASE I SURFACE WATER SAMPLE LOCATIONS

Station ID	Description
URC-1	Upper Rainy Creek above Mine Area
URC-2	Upper Rainy Creek above Mine Area
LRC-1	Lower Rainy Creek above confluence with Carney Creek
LRC-2	Lower Rainy Creek below confluence with Carney Creek
LRC-3	Lower Rainy Creek
LRC-4	Lower Rainy Creek
LRC-5	Lower Rainy Creek
LRC-6	Lower Rainy Creek just above confluence with the Kootenai River
FC-1	Fleetwood Creek above Mine Area
FC-2	Fleetwood Creek above Tailings Impoundment
FC-Pond	Fleetwood Creek Upper Pond
TP	Tailings Impoundment
TP-TOE1	Toe drain of impoundment
TP-TOE2	Toe drain flow to Rainy Creek below diversion
MP	Mill Pond
CC-1	Carney Creek
CC-2	Carney Creek just above confluence with Rainy Creek
CCS-1	Spring from base of west waste rock pile
CCS-6	Spring below west waste rock pile
CCS-8	Spring below west waste rock pile
CCS-9	Spring discharging to lower Carney Creek
CCS-11	Spring below central waste rock pile
CCS-14	Spring between central and east waste rock piles
CCS-16	Spring below east waste rock pile

TABLE 2-2. PHASE I SUMMARY OF DETECTED CHEMICALS IN SURFACE WATER

Analyte Type	Detected Analyte	Units	Surface Water Summary Statistics				
			Number of Samples		Detection Frequency	Mean ^a	Maximum Detected
			Detects	Total			
Metals (Total Recoverable)	Aluminum	µg/L	8	24	33%	98	330
	Barium	µg/L	24	24	100%	500	1,000
	Calcium	µg/L	24	24	100%	75,459	128,000
	Chromium	µg/L	1	24	4%	5	10
	Copper	µg/L	2	24	8%	1	5
	Iron	µg/L	17	24	71%	198	1,520
	Lead	µg/L	1	24	4%	1	5.1
	Magnesium	µg/L	24	24	100%	22,583	47,000
	Manganese	µg/L	9	24	38%	89	650
	Nickel	µg/L	2	24	8%	3	8
	Potassium	µg/L	24	24	100%	12,542	31,000
	Sodium	µg/L	24	24	100%	6,500	13,000
	Vanadium	µg/L	2	24	8%	5	10
	Zinc	µg/L	1	24	4%	6	20
Metals (Dissolved)	Barium	µg/L	24	24	100%	467	1,000
	Calcium	µg/L	24	24	100%	82,250	131,000
	Copper	µg/L	1	24	4%	1	4
	Iron	µg/L	3	24	13%	71	1,340
	Magnesium	µg/L	24	24	100%	23,750	49,000
	Manganese	µg/L	5	24	21%	45	660
	Potassium	µg/L	24	24	100%	13,417	33,000
	Sodium	µg/L	24	24	100%	7,542	15,000
	Vanadium	µg/L	1	24	4%	5	10
Anions	Chloride	µg/L	22	24	92%	4,500	10,000
	Fluoride	µg/L	24	24	100%	442	900
	Sulfate	µg/L	24	24	100%	19,917	58,000
	Phosphorus, Orthophosphate as P	µg/L	24	24	100%	246	1,160
Nitrogen	Nitrogen, Kjeldahl, Total as N	µg/L	3	15	20%	484	3,100
	Nitrogen, Nitrate as N	µg/L	2	15	13%	51	580
	Nitrogen, Nitrate+Nitrite as N	µg/L	5	15	33%	93	1,160
	Nitrogen, Nitrite as N	µg/L	1	24	4%	5.2	10
Hydrocarbons	Benzene	µg/L	1	26	4%	0.27	0.65
	C5 to C8 Aliphatics	µg/L	2	24	8%	13	62
	Total Extractable Hydrocarbons	µg/L	2	26	8%	169	470
	Total Purgeable Hydrocarbons	µg/L	2	24	8%	13	53
Radionuclides	Gross Alpha	pCi/L	2	2	100%	2.1	2.5
Water Quality Parameters	Alkalinity, Total as CaCO ₃	mg/L	24	24	100%	300	485
	Bicarbonate as HCO ₃	mg/L	24	24	100%	365	591
	Carbonate as CO ₃	mg/L	2	24	8%	3	11
	Hardness as CaCO ₃	mg/L	20	20	100%	307	464
	Solids, Total Dissolved TDS @ 180 C	mg/L	24	24	100%	371	549
	Solids, Total Suspended TSS @ 105 C	mg/L	4	24	17%	8	36
	Organic Carbon, Dissolved (DOC)	mg/L	23	23	100%	4	15

^(a) Non-detects evaluated at 1/2 the PQL.

Notes:

µg/L = micrograms per liter

CaCO₃ = calcium carbonate

HCO₃ = hydrogen carbonate

mg/L = milligrams per liter

N = nitrogen

pCi/L = picocuries per liter

PQL = practical quantitation limit

TDS = total dissolved solids

TABLE 2-3. PHASE I SUMMARY OF ASBESTOS RESULTS FOR SURFACE WATER

Location	Station ID	Index ID	Sample Date	Filter Prep Date	Analysis Date	GOs Counted	Volume Applied to Filter (mL)	Sensitivity (1/L)	Total LA		LA > 10 µm in length	
									N Structures	Water Conc. (MFL)	N Structures	Water Conc. (MFL)
Upper Rainy Creek	URC-1	P1-00391	10/14/2007	10/16/2007	12/3/2007	20	100	5E+04	0	0.0	0	0.0
	URC-2	P1-00390	10/14/2007	10/16/2007	11/30/2007	9	100	1E+05	52	5.8	1	0.1
Mill Pond	MP	P1-00313	10/16/2007	10/17/2007	12/12/2007	4	50	5E+05	54	26.9	20	10.0
Tailings Impoundment	TP	P1-00269	10/13/2007	10/16/2007	11/16/2007	1	50	2E+06	57	113.6	19	37.9
	TP-TOE1	P1-00254	10/16/2007	10/17/2007	12/12/2007	20	100	5E+04	0	0.0	0	0.0
	TP-TOE2	P1-00312	10/16/2007	10/17/2007	8/11/2008	50	10	2E+05	10	2.0	6	1.2
Lower Rainy Creek	LRC-1	P1-00304	10/15/2007	10/16/2007	12/11/2007	20	100	5E+04	4	0.2	0	0.0
	LRC-2	P1-00251	10/15/2007	10/16/2007	12/5/2007	20	100	5E+04	2	0.1	1	0.0
	LRC-3	P1-00303	10/15/2007	10/16/2007	12/11/2007	20	100	5E+04	4	0.2	0	0.0
	LRC-4	P1-00302	10/15/2007	10/16/2007	12/4/2007	20	100	5E+04	21	1.0	3	0.1
	LRC-5	P1-00301	10/15/2007	10/16/2007	12/4/2007	20	100	5E+04	25	1.2	2	0.1
	LRC-6	P1-00300	10/15/2007	10/16/2007	12/11/2007	20	100	5E+04	0	0.0	0	0.0
Fleetwood Creek	FC-1	P1-00267	10/13/2007	10/16/2007	11/15/2007	13	100	8E+04	51	3.9	12	0.9
	FC-2	P1-00268	10/13/2007	10/16/2007	11/14/2007	20	100	5E+04	4	0.2	1	0.0
	FC-Pond	P1-00266	10/13/2007	10/16/2007	11/14/2007	4	10	2E+06	50	124.5	3	7.5
Carney Creek	CC-1	P1-00381	10/11/2007	10/12/2007	11/8/2007	21	100	5E+04	20	0.9	7	0.3
	CC-2	P1-00380	10/11/2007	10/12/2007	11/8/2007	20	100	5E+04	1	0.0	1	0.0
Seeps	CCS-1	P1-00382	10/12/2007	10/15/2007	11/9/2007	7	100	1E+05	53	7.5	3	0.4
	CCS-6	P1-00385	10/12/2007	10/15/2007	11/9/2007	5	10	2E+06	51	101.6	2	4.0
	CCS-8	P1-00317	10/17/2007	10/18/2007	12/13/2007	20	100	5E+04	0	0.0	0	0.0
	CCS-9	P1-00315	10/16/2007	10/17/2007	12/13/2007	20	100	5E+04	0	0.0	0	0.0
	CCS-11	P1-00383	10/12/2007	10/15/2007	11/9/2007	30	10	3E+05	50	16.6	10	3.3
	CCS-14	P1-00265	10/13/2007	10/16/2007	11/14/2007	5	100	2E+05	55	11.0	0	0.0
	CCS-16	P1-00316	10/17/2007	10/18/2007	12/14/2007	50	25	8E+04	0	0.0	0	0.0

All samples analyzed by TEM in basic accordance with EPA Method 100.2 (EFA = 1295 mm²; GO area = 0.013 mm²).

Filter preparation laboratory = EMSL Mobile Laboratory; TEM analysis laboratory = EMSL27

mL = milliliters

L = liter

mm = millimeter

µm = micron

GO = grid opening

LA = Libby amphibole

MFL = million fibers per liter

TEM = transmission electron microscopy

EFA = effective filter area

EPA = U.S. Environmental Protection Agency

TABLE 2-4. PHASE I SUMMARY OF FIELD MEASUREMENTS FOR SURFACE WATER

Station ID	Sample Date	Temperature (°C)	pH	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Oxidation/Reduction Potential (mV)	Turbidity (NTU)
CC-1	10/11/2007	7.01	7.94	0.693	9.32	297	23.1
CC-2	10/11/2007	7.81	6.67	0.715	9.06	337	2.1
CCS-1	10/12/2007	8.77	8.23	0.746	8.28	266	225
CCS-11	10/12/2007	8.78	8.09	0.654	11.51	1.06	12.7
CCS-14	10/13/2007	7.12	8.41	0.59	30.5	283	24.1
CCS-16	10/17/2007	7.44	8.04	0.904	30.79	188	6.4
CCS-6	10/12/2007	5.73	7.89	0.767	7.2	1.92	5999
CCS-8	10/17/2007	7.27	8.2	0.75	8.84	292	2.5
CCS-9	10/16/2007	8.39	8.16	0.746	24.05	323	3.8
FC UPPER POND	10/13/2007	9.34	8.8	0.295	11.7	263	37.2
FC-1	10/13/2007	6.5	8.76	11.17	10.65	287	8.5
FC-2	10/13/2007	7.08	8.69	7.12	10.84	259	2.4
LRC-1	10/15/2007	8.93	9.73	0.52	12.1	262	3.6
LRC-2	10/15/2007	7.85	8.68	0.522	11.52	310	3.2
LRC-4	10/15/2007	5.04	8.72	0.573	12.37	319	4.7
LRC-3	10/15/2007	6.18	8.71	0.573	9.69	297	4.5
LRC-5	10/15/2007	4.79	8.83	0.57	13.34	332	3.7
LRC-6	10/15/2007	5.73	8.74	0.546	11.92	311	7.5
MP	10/16/2007	8.73	8.05	0.526	9.94	312	60.5
TP	10/13/2007	13.1	8.77	0.302	9.04	285	11.3
TP-TOE1	10/16/2007	8.73	7.71	0.703	6.08	299	1.9
TP-TOE2	10/16/2007	9.04	7.96	0.648	10.89	294	25.1
URC-1	10/14/2007	4.68	8.46	0.377	12.21	295	4.2
URC-2	10/14/2007	3.89	8.43	0.402	37.72	278	6.8

°C = degrees Celcius

mS/cm = millisiemens per cm

mg/L = milligrams per liter

mV = millivolts

NTU = nephelometric turbidity units

**TABLE 2-5. PHASE I FLOW RECORD BY SURFACE WATER
SAMPLING LOCATION**

Station ID	Date	Time	Flow (ft ³ /sec)
URC-1	10/18/2007	12:00	0.09
URC-2	10/18/2007	11:30	0.04*
TP-TOE1	10/18/2007	12:20	0.29
TP-TOE2	10/18/2007	12:35	0.58
LRC-1	10/18/2007	12:15	0.41
LRC-2	10/18/2007	11:55	0.5
LRC-3	10/18/2007	11:33	0.76
LRC-4	10/18/2007	11:12	0.34
LRC-5	10/18/2007	10:50	0.63
LRC-6	10/18/2007	10:44	0.41
FC-1	10/18/2007	10:45	0.14
FC-2	10/18/2007	11:10	0
CC-1	10/18/2007	10:15	0.07
CC-2	10/18/2007	10:00	0.19

*A 5% leakage was noted during flow measurement.

ft³/sec = cubic feet per second

TABLE 2-6. PHASE II PART A SURFACE WATER SAMPLE LOCATIONS

Station ID	Description
URC-1	Upper Rainy Creek above Mine Area
URC-1A	Upper Rainy Creek above Mine Area 100 yards north of Rainy Creek Rd.
URC-2	Upper Rainy Creek above Mine Area
LRC-1	Lower Rainy Creek above confluence with Carney Creek
LRC-2	Lower Rainy Creek below confluence with Carney Creek
LRC-3	Lower Rainy Creek
LRC-4	Lower Rainy Creek
LRC-5	Lower Rainy Creek
LRC-6	Lower Rainy Creek just above confluence with the Kootenai River
FC-1	Fleetwood Creek above Mine Area
FC-2	Fleetwood Creek above Tailings Impoundment
FC-Pond	Fleetwood Creek Upper Pond
TP	Tailings Impoundment
TP-TOE1	Toe drain of impoundment
TP-TOE2	Toe drain flow to Rainy Creek below diversion
TP-OVERFLOW	In the overflow ditch from tailings impoundment
UTP	Upper Tailings Impoundment
MP	Mill Pond
CC-1	Carney Creek
CC-2	Carney Creek just above confluence with Rainy Creek
CC-POND	Pond on lower Carney Creek
CCS-1	Spring from base of west waste rock pile
CCS-6	Spring below west waste rock pile
CCS-8	Spring below west waste rock pile
CCS-9	Spring discharging to lower Carney Creek
CCS-11	Spring below central waste rock pile
CCS-14	Spring between central and east waste rock piles
CCS-16	Spring below east waste rock pile
KR-1	Kootenai River parallel to the northern river bank downstream of the mouth of Rainy Creek
KR-2	
KR-3	
KR-4	Kootenai River along a perpendicular transect downstream of Rainy Creek
KR-5	
KR-6	
KR-7	
KR-8	
UKR	Kootenai River upstream of Rainy Creek

TABLE 2-7. PHASE II PART A SUMMARY OF DETECTED CHEMICALS IN SURFACE WATER

Analyte Type	Detected Analyte	Units	Surface Water Summary Statistics				
			Number of Samples		Detection Frequency	Mean ^a	Maximum Detected
			Detects	Total			
Metals (Total Recoverable)	Aluminum	µg/L	12	56	21%	99	1,080
	Barium	µg/L	56	56	100%	389	1,000
	Calcium	µg/L	56	56	100%	71,625	141,000
	Chromium	µg/L	3	56	5%	5.3	10
	Copper	µg/L	4	56	7%	1.4	16
	Iron	µg/L	30	56	54%	169	1,830
	Lead	µg/L	5	56	9%	0.41	4.3
	Magnesium	µg/L	56	56	100%	20,893	46,000
	Manganese	µg/L	24	56	43%	68	940
	Potassium	µg/L	56	56	100%	12,054	34,000
	Sodium	µg/L	56	56	100%	7,375	16,000
	Vanadium	µg/L	4	56	7%	5.4	10
	Zinc	µg/L	1	56	2%	5.3	20
Metals (Dissolved)	Aluminum	µg/L	1	56	2%	46	110
	Barium	µg/L	56	56	100%	409	1,000
	Calcium	µg/L	56	56	100%	71,500	153,000
	Iron	µg/L	3	56	5%	65	1410
	Lead	µg/L	1	56	2%	0.3	0.5
	Magnesium	µg/L	56	56	100%	20,696	48,000
	Manganese	µg/L	11	56	20%	56.3	980
	Potassium	µg/L	56	56	100%	11,321	32,000
	Sodium	µg/L	56	56	100%	6,286	14,000
	Vanadium	µg/L	3	56	5%	5.3	10
Anions	Chloride	µg/L	45	56	80%	3,045	9,000
	Fluoride	µg/L	54	56	96%	423	1,100
	Sulfate	µg/L	56	56	100%	16,929	64,000
	Phosphorus, Orthophosphate as P	µg/L	56	56	100%	214	1,030
Nitrogen	Nitrogen, Kjeldahl, Total as N	µg/L	4	56	7%	300	1,300
	Nitrogen, Nitrate as N	µg/L	26	56	46%	147	1,510
	Nitrogen, Nitrate+Nitrite as N	µg/L	26	56	46%	148	1,510
	Nitrogen, Nitrite as N	µg/L	5	56	9%	7.8	80
Hydrocarbons	Total Extractable Hydrocarbons	µg/L	1	58	2%	157	571
Radionuclides	Gross Alpha	pCi/L	4	4	100%	1.6	2.6
	Gross Beta	pCi/L	4	4	100%	6.6	9.0
Water Quality Parameters	Alkalinity, Total as CaCO ₃	mg/L	56	56	100%	262	516
	Bicarbonate as HCO ₃	mg/L	56	56	100%	317	630
	Carbonate as CO ₃	mg/L	6	56	11%	3	17
	Hardness as CaCO ₃	mg/L	56	56	100%	266	537
	Solids, Total Dissolved TDS @ 180 C	mg/L	56	56	100%	321	592
	Solids, Total Suspended TSS @ 105 C	mg/L	5	56	9%	6	21
	Organic Carbon, Dissolved (DOC)	mg/L	56	56	100%	4	13

^(a) Non-detects evaluated at 1/2 the PQL.

Notes:

µg/L = micrograms per liter

CaCO₃ = calcium carbonate

HCO₃ = hydrogen carbonate

mg/L = milligrams per liter

N = nitrogen

pCi/L = picocuries per liter

PQL = practical quantitation limit

TDS = total dissolved solids

TABLE 2-8. PHASE II PART A ELEMENT 1 SUMMARY OF ASBESTOS RESULTS FOR SURFACE WATER

Location	Station ID	Event	Index ID	Sample Date	Filter Prep Date	Analysis Date	GOs Counted	Volume Applied to Filter (mL)	Sensitivity (1/L)	Total LA		LA > 10 µm in length		
										N Structures	Water Conc. (MFL)	N Structures	Water Conc. (MFL)	
Upper Rainy Creek	URC-1	Round 1	P2-00427	6/27/2008	12/15/2008	12/17/2008	20	100	5E+04	0	0.0	0	0.0	
		Round 2	P2-00897	9/11/2008	12/29/2008	12/31/2008	20	100	5E+04	0	0.0	0	0.0	
	URC-1A	Round 1	P2-00422	6/26/2008	12/14/2008	12/16/2008	20	100	5E+04	0	0.0	0	0.0	
		Round 2	P2-00896	9/11/2008	12/29/2008	12/29/2008	20	100	5E+04	0	0.0	0	0.0	
	URC-2	Round 1	P2-00421	6/26/2008	12/14/2008	12/16/2008	20	100	5E+04	0	0.0	0	0.0	
		Round 2	P2-00895	9/11/2008	12/29/2008	12/29/2008	20	100	5E+04	2	0.1	0	0.0	
	Mill Pond	MP	Round 1	P2-00411	6/25/2008	12/5/2008	12/11/2008	40	50	5E+04	0	0.0	0	0.0
			Round 2	P2-00890	9/10/2008	12/29/2008	12/30/2008	20	100	5E+04	0	0.0	0	0.0
Tailings Impoundment	UTP (shallow)	Round 1	P2-00450	6/29/2008	12/15/2008	12/22/2008	20	100	5E+04	8	0.4	2	0.1	
		Round 2	P2-00899	9/12/2008	12/30/2008	1/4/2009	1	100	1E+06	27	26.9	0	0.0	
	UTP (deep)	Round 1	P2-00456	6/29/2008	12/15/2008	12/22/2008	8	25	5E+05	26	13.0	9	4.5	
		Round 2	P2-00898	9/12/2008	12/30/2008	1/2/2009	2	100	5E+05	36	17.9	6	3.0	
	TP	Round 1	P2-00420	6/26/2008	12/14/2008	12/16/2008	3	100	3E+05	46	15.3	11	3.7	
		Round 2	P2-00893	9/11/2008	12/29/2008	12/30/2008	1	50	2E+06	71	141.5	18	35.9	
	TP-TOE1	Round 1	P2-00453	6/26/2008	12/14/2008	12/16/2008	20	100	5E+04	0	0.0	0	0.0	
		Round 2	P2-00933	9/10/2008	12/29/2008	12/30/2008	20	100	5E+04	0	0.0	0	0.0	
	TP-TOE2	Round 1	P2-00412	6/25/2008	12/5/2008	12/11/2008	40	50	5E+04	1	0.0	0	0.0	
		Round 2	P2-00892	9/10/2008	12/29/2008	12/30/2008	20	100	5E+04	0	0.0	0	0.0	
Lower Rainy Creek	LRC-1	Round 1	P2-00410	6/25/2008	12/5/2008	12/11/2008	40	50	5E+04	0	0.0	0	0.0	
		Round 2	P2-00889	9/10/2008	12/29/2008	12/30/2008	11	100	9E+04	25	2.3	7	0.6	
	LRC-2	Round 1	P2-00451	6/25/2008	12/5/2008	12/10/2008	40	50	5E+04	3	0.1	0	0.0	
		Round 2	P2-00930	9/9/2008	12/26/2008	12/28/2008	20	100	5E+04	7	0.3	3	0.1	
	LRC-3	Round 1	P2-00404	6/24/2008	12/5/2008	12/10/2008	7	50	3E+05	28	8.0	7	2.0	
		Round 2	P2-00885	9/9/2008	12/26/2008	12/29/2008	19	100	5E+04	26	1.4	7	0.4	
	LRC-4	Round 1	P2-00403	6/24/2008	12/5/2008	12/10/2008	8	50	2E+05	27	6.7	3	0.7	
		Round 2	P2-00883	9/9/2008	12/26/2008	12/28/2008	20	100	5E+04	17	0.8	4	0.2	
	LRC-5	Round 1	P2-00402	6/24/2008	12/5/2008	12/10/2008	6	50	3E+05	25	8.3	7	2.3	
		Round 2	P2-00881	9/9/2008	12/26/2008	12/29/2008	20	100	5E+04	12	0.6	1	0.0	
	LRC-6	Round 1	P2-00401	6/24/2008	12/5/2008	12/10/2008	6	50	3E+05	26	8.6	5	1.7	
		Round 2	P2-00880	9/9/2008	12/26/2008	12/29/2008	20	100	5E+04	14	0.7	7	0.3	
Fleetwood Creek	FC-1	Round 1	P2-00432	6/27/2008	12/15/2008	12/19/2008	20	100	5E+04	2	0.1	2	0.1	
		Round 2	P2-00904	9/12/2008	12/30/2008	1/2/2009	20	100	5E+04	0	0.0	0	0.0	
	FC-2	Round 1	P2-00428	6/27/2008	12/15/2008	12/17/2008	20	100	5E+04	0	0.0	0	0.0	
		Round 2	P2-00901	9/12/2008	12/30/2008	1/2/2009	20	100	5E+04	4	0.2	0	0.0	

TABLE 2-8. PHASE II PART A ELEMENT 1 SUMMARY OF ASBESTOS RESULTS FOR SURFACE WATER

Location	Station ID	Event	Index ID	Sample Date	Filter Prep Date	Analysis Date	GOs Counted	Volume Applied to Filter (mL)	Sensitivity (1/L)	Total LA		LA > 10 µm in length	
										N Structures	Water Conc. (MFL)	N Structures	Water Conc. (MFL)
Fleetwood Creek Pond	FC-POND	Round 1	P2-00430	6/27/2008	12/15/2008	12/18/2008	10	25	4E+05	25	10.0	4	1.6
		Round 2	P2-00902	9/12/2008	12/30/2008	1/5/2009	1	10	1E+07	110	1095.8	29	288.9
Carney Creek	CC-1	Round 1	P2-00444	6/28/2008	12/15/2008	12/17/2008	16	100	6E+04	27	1.7	7	0.4
		Round 2	P2-00914	9/14/2008	12/31/2008	1/9/2009	21	100	5E+04	0	0.0	0	0.0
	CC-2	Round 1	P2-00409	6/25/2008	12/5/2008	12/11/2008	40	50	5E+04	11	0.5	4	0.2
		Round 2	P2-00887	9/10/2008	12/29/2008	12/30/2008	20	100	5E+04	3	0.1	1	0.0
Carney Creek Pond	CC-POND	Round 1	P2-00439	6/28/2008	12/15/2008	12/17/2008	3	100	3E+05	34	11.3	1	0.3
		Round 2	P2-00909	9/13/2008	12/31/2008	1/15/2009	3	25	1E+06	28	37.2	4	5.3
Seeps	CCS-1	Round 1	P2-00443	6/28/2008	12/15/2008	12/18/2008	1	25	4E+06	54	215.2	8	31.9
		Round 2	P2-00913	9/13/2008	12/31/2008	1/6/2009	2	100	5E+05	27	13.4	7	3.5
	CCS-6	Round 1	P2-00442	6/28/2008	12/15/2008	12/17/2008	3	25	1E+06	38	50.5	9	12.0
		Round 2	P2-00912	9/13/2008	12/31/2008	1/7/2009	3	100	3E+05	33	11.0	4	1.3
	CCS-8	Round 1	P2-00441	6/28/2008	12/15/2008	12/17/2008	40	50	5E+04	3	0.1	1	0.0
		Round 2	P2-00911	9/13/2008	12/31/2008	1/8/2009	50	100	2E+04	8	0.2	0	0.0
	CCS-9	Round 1	P2-00446	6/29/2008	12/15/2008	12/17/2008	20	100	5E+04	2	0.1	1	0.0
		Round 2	P2-00907	9/13/2008	12/31/2008	1/6/2009	20	100	5E+04	0	0.0	0	0.0
	CCS-11	Round 1	P2-00447	6/29/2008	12/15/2008	12/19/2008	10	25	4E+05	25	10.0	7	2.8
		Round 2	P2-00905	9/12/2008	12/30/2008	1/2/2009	20	100	5E+04	22	1.1	7	0.3
	CCS-14	Round 1	P2-00449	6/29/2008	12/15/2008	12/18/2008	3	100	3E+05	34	11.3	5	1.7
		Round 2	P2-00906	9/12/2008	12/30/2008	1/2/2009	1	50	2E+06	26	51.8	4	8.0
	CCS-16	Round 1	P2-00445	6/28/2008	12/15/2008	12/19/2008	50	25	8E+04	1	0.1	1	0.1
		Round 2	P2-00917	9/14/2008	12/31/2008	1/9/2009	50	10	2E+05	9	1.8	6	1.2

All samples analyzed by TEM in basic accordance with EPA Method TEM ISO 10312 (EFA = 1295 mm²; GO area = 0.013 mm²).

Filter preparation laboratory = EMSL Mobile Laboratory; TEM analysis laboratory = EMSL27

mL = milliliters

L = liter

mm = millimeter

µm = micron

GO = grid opening

LA = Libby amphibole

MFL = million fibers per liter

TEM = transmission electron microscopy

EFA = effective filter area

EPA = U.S. Environmental Protection Agency

TABLE 2-9. PHASE II PART A ELEMENT 2 SUMMARY OF ASBESTOS RESULTS FOR SURFACE WATER

Station ID	Event	Index ID	Sample Date	Filter Prep Date	Analysis Date	GOs Counted	Volume Applied to Filter (mL)	Sensitivity (1/L)	Total LA		LA > 10 µm in length	
									N Structures	Water Conc. (MFL)	N Structures	Water Conc. (MFL)
CC-2	Week 1	P2-00004	4/7/2008	4/9/2008	6/3/2008	50	10	2.0E+05	7	1.4	1	0.2
	Week 2	P2-00024	4/14/2008	4/15/2008	9/9/2008	5	30	6.6E+05	25	16.6	4	2.7
	Week 3	P2-00043	4/21/2008	4/22/2008	10/6/2008	15	50	1.3E+05	25	3.3	1	0.1
	Week 4	P2-00062	4/28/2008	4/29/2008	12/16/2008	40	10	2.5E+05	25	6.2	2	0.5
	Week 5	P2-00083	5/5/2008	5/6/2008	1/22/2009	6	50	3.3E+05	26	8.6	3	1.0
	Week 6	P2-00104	5/12/2008	5/13/2008	8/20/2008	5	25	8.0E+05	29	23.1	1	0.8
	Week 7	P2-00304	5/19/2008	5/21/2008	9/3/2008	7	50	2.8E+05	26	7.4	2	0.6
	Week 8	P2-00323	5/26/2008	5/27/2008	9/23/2008	21	25	1.9E+05	25	4.7	2	0.4
	Week 9	P2-00337	6/2/2008	6/4/2008	11/7/2008	11	100	9.1E+04	27	2.4	0	0.0
	Week 10	P2-00351	6/9/2008	6/10/2008	11/23/2008	19	50	1.0E+05	27	2.8	4	0.4
	Week 11	P2-00365	6/16/2008	12/5/2008	12/15/2008	40	50	5.0E+04	0	0.0	0	0.0
CC-POND	Week 5	P2-00085	5/6/2008	5/7/2008	1/19/2009	6	10	1.7E+06	27	44.8	1	1.7
	Week 6	P2-00102	5/12/2008	5/13/2008	8/18/2008	8	10	1.2E+06	26	32.4	2	2.5
	Week 7	P2-00302	5/19/2008	5/21/2008	9/4/2008	10	10	1.0E+06	25	24.9	4	4.0
	Week 8	P2-00330	5/27/2008	5/28/2008	10/29/2008	3	25	1.3E+06	28	37.2	5	6.6
	Week 9	P2-00342	6/3/2008	6/4/2008	12/12/2008	11	10	9.1E+05	25	22.6	4	3.6
	Week 10	P2-00359	6/10/2008	12/4/2008	12/5/2008	13	50	1.5E+05	25	3.8	6	0.9
	Week 11	P2-00373	6/17/2008	6/18/2008	9/14/2008	12	10	8.3E+05	26	21.6	0	0.0
FC-2	Week 1	P2-00008	4/8/2008	4/8/2008	6/13/2008	50	5	4.0E+05	7	2.8	2	0.8
	Week 2	P2-00031	4/14/2008	4/15/2008	9/30/2008	25	30	1.3E+05	25	3.3	3	0.4
	Week 3	P2-00052	4/22/2008	4/23/2008	12/4/2008	5	75	2.7E+05	26	6.9	3	0.8
	Week 4	P2-00070	4/28/2008	4/29/2008	1/6/2009	13	10	7.7E+05	26	19.9	4	3.1
	Week 5	P2-00100	5/7/2008	5/7/2008	1/27/2009	6	50	3.3E+05	25	8.3	1	0.3
	Week 6	P2-00114	5/13/2008	5/14/2008	11/20/2008	9	100	1.1E+05	26	2.9	4	0.4
	Week 7	P2-00313	5/20/2008	5/21/2008	9/18/2008	31	50	6.4E+04	26	1.7	5	0.3
	Week 8	P2-00334	5/27/2008	5/28/2008	10/30/2008	24	100	4.2E+04	18	0.7	3	0.1
	Week 9	P2-00348	6/3/2008	6/4/2008	12/12/2008	20	100	5.0E+04	0	0.0	0	0.0
	Week 10	P2-00362	6/10/2008	12/4/2008	12/11/2008	40	50	5.0E+04	1	0.0	0	0.0
	Week 11	P2-00376	6/17/2008	6/18/2008	9/24/2008	40	50	5.0E+04	7	0.3	0	0.0
FC-POND	Week 1	P2-00009	4/8/2008	4/9/2008	6/23/2008	40	50	5.0E+04	14	0.7	2	0.1
	Week 2	P2-00032	4/14/2008	4/15/2008	9/30/2008	23	30	1.4E+05	27	3.9	0	0.0
	Week 3	P2-00053	4/22/2008	4/23/2008	12/5/2008	2	20	2.5E+06	28	69.7	3	7.5
	Week 4	P2-00071	4/28/2008	4/29/2008	1/6/2009	3	10	3.3E+06	25	83.0	3	10.0
	Week 5	P2-00096	5/6/2008	5/7/2008	1/21/2009	3	10	3.3E+06	25	83.0	2	6.6

TABLE 2-9. PHASE II PART A ELEMENT 2 SUMMARY OF ASBESTOS RESULTS FOR SURFACE WATER

Station ID	Event	Index ID	Sample Date	Filter Prep Date	Analysis Date	GOs Counted	Volume Applied to Filter (mL)	Sensitivity (1/L)	Total LA		LA > 10 µm in length	
									N Structures	Water Conc. (MFL)	N Structures	Water Conc. (MFL)
LRC-1	Week 1	P2-00002	4/7/2008	4/9/2008	5/28/2008	32	5	6.2E+05	50	31.1	12	7.5
	Week 2	P2-00023	4/14/2008	4/15/2008	9/9/2008	4	30	8.3E+05	26	21.6	1	0.8
	Week 3	P2-00044	4/21/2008	4/22/2008	10/9/2008	50	30	6.6E+04	3	0.2	1	0.1
	Week 4	P2-00063	4/28/2008	4/29/2008	12/18/2008	12	50	1.7E+05	25	4.2	1	0.2
	Week 5	P2-00084	5/5/2008	5/6/2008	1/23/2009	18	50	1.1E+05	25	2.8	2	0.2
	Week 6	P2-00105	5/12/2008	5/13/2008	8/20/2008	11	25	3.6E+05	25	9.1	3	1.1
	Week 7	P2-00305	5/19/2008	5/21/2008	9/5/2008	10	10	1.0E+06	28	27.9	4	4.0
	Week 8	P2-00324	5/26/2008	5/27/2008	9/23/2008	8	25	5.0E+05	25	12.5	2	1.0
	Week 9	P2-00338	6/2/2008	6/4/2008	11/6/2008	9	50	2.2E+05	27	6.0	2	0.4
	Week 10	P2-00353	6/9/2008	6/10/2008	12/3/2008	40	50	5.0E+04	13	0.6	0	0.0
	Week 11	P2-00366	6/16/2008	12/5/2008	12/15/2008	50	25	8.0E+04	3	0.2	1	0.1
LRC-2	Week 1	P2-00003	4/7/2008	4/9/2008	5/30/2008	13	50	1.5E+05	50	7.7	7	1.1
	Week 2	P2-00025	4/14/2008	4/15/2008	9/10/2008	4	30	8.3E+05	26	21.6	2	1.7
	Week 3	P2-00042	4/21/2008	4/22/2008	10/3/2008	4	50	5.0E+05	31	15.4	3	1.5
	Week 4	P2-00064	4/28/2008	4/29/2008	12/18/2008	8	50	2.5E+05	27	6.7	4	1.0
	Week 5	P2-00082	5/5/2008	5/6/2008	1/21/2009	10	50	2.0E+05	29	5.8	2	0.4
	Week 6	P2-00103	5/12/2008	5/13/2008	8/18/2008	13	25	3.1E+05	26	8.0	5	1.5
	Week 7	P2-00303	5/19/2008	5/21/2008	9/2/2008	50	10	2.0E+05	9	1.8	2	0.4
	Week 8	P2-00322	5/26/2008	5/27/2008	9/22/2008	15	25	2.7E+05	26	6.9	2	0.5
	Week 9	P2-00336	6/2/2008	6/4/2008	11/5/2008	21	50	9.5E+04	26	2.5	4	0.4
	Week 10	P2-00350	6/9/2008	6/10/2008	11/22/2008	31	50	6.4E+04	27	1.7	7	0.4
	Week 11	P2-00364	6/16/2008	12/5/2008	12/15/2008	50	25	8.0E+04	12	1.0	2	0.2
LRC-6	Week 1	P2-00014	4/8/2008	4/9/2008	8/19/2008	50	10	2.0E+05	5	1.0	2	0.4
	Week 2	P2-00021	4/14/2008	4/15/2008	8/26/2008	48	10	2.1E+05	25	5.2	1	0.2
	Week 3	P2-00041	4/21/2008	4/22/2008	10/2/2008	13	50	1.5E+05	26	4.0	2	0.3
	Week 4	P2-00061	4/28/2008	4/29/2008	12/5/2008	34	10	2.9E+05	26	7.6	2	0.6
	Week 5	P2-00081	5/5/2008	5/6/2008	1/21/2009	4	50	5.0E+05	25	12.5	4	2.0
	Week 6	P2-00101	5/12/2008	5/13/2008	8/14/2008	2	25	2.0E+06	27	53.8	8	15.9
	Week 7	P2-00301	5/19/2008	5/21/2008	8/29/2008	4	10	2.5E+06	34	84.7	11	27.4
	Week 8	P2-00321	5/26/2008	5/27/2008	9/18/2008	7	25	5.7E+05	26	14.8	3	1.7
	Week 9	P2-00335	6/2/2008	6/4/2008	11/5/2008	50	10	2.0E+05	10	2.0	6	1.2
	Week 10	P2-00349	6/9/2008	6/10/2008	11/22/2008	5	50	4.0E+05	27	10.8	6	2.4
	Week 11	P2-00363	6/16/2008	12/5/2008	12/14/2008	8	25	5.0E+05	25	12.5	3	1.5

TABLE 2-9. PHASE II PART A ELEMENT 2 SUMMARY OF ASBESTOS RESULTS FOR SURFACE WATER

Station ID	Event	Index ID	Sample Date	Filter Prep Date	Analysis Date	GOs Counted	Volume Applied to Filter (mL)	Sensitivity (1/L)	Total LA		LA > 10 µm in length	
									N Structures	Water Conc. (MFL)	N Structures	Water Conc. (MFL)
MP	Week 1	P2-00001	4/7/2008	4/9/2008	5/23/2008	7	50	2.8E+05	50	14.2	8	2.3
	Week 2	P2-00022	4/14/2008	4/15/2008	9/8/2008	7	10	1.4E+06	25	35.6	6	8.5
	Week 3	P2-00045	4/21/2008	4/22/2008	10/15/2008	6	30	5.5E+05	26	14.4	4	2.2
	Week 4	P2-00072	4/28/2008	4/29/2008	1/8/2009	40	10	2.5E+05	25	6.2	6	1.5
		P2-00201	4/29/2008	4/30/2008	1/12/2009	11	50	1.8E+05	27	4.9	2	0.4
		P2-00203		4/30/2008	1/13/2009	8	50	2.5E+05	26	6.5	4	1.0
		P2-00204		4/30/2008	1/14/2009	13	50	1.5E+05	25	3.8	3	0.5
	Week 5	P2-00086	5/6/2008	5/7/2008	1/20/2009	50	25	8.0E+04	9	0.7	1	0.1
	Week 6	P2-00107	5/12/2008	5/13/2008	8/20/2008	23	25	1.7E+05	26	4.5	2	0.3
	Week 7	P2-00306	5/19/2008	5/21/2008	9/10/2008	8	25	5.0E+05	26	13.0	3	1.5
TP	Week 8	P2-00325	5/26/2008	5/27/2008	10/1/2008	8	25	5.0E+05	26	13.0	3	1.5
	Week 9	P2-00339	6/2/2008	6/4/2008	11/7/2008	40	50	5.0E+04	20	1.0	0	0.0
	Week 10	P2-00354	6/9/2008	6/10/2008	12/3/2008	40	50	5.0E+04	10	0.5	2	0.1
	Week 11	P2-00367	6/16/2008	12/5/2008	12/15/2008	40	50	5.0E+04	1	0.0	0	0.0
	Week 1	P2-00012	4/8/2008	4/9/2008	7/16/2008	2	50	1.0E+06	31	30.9	6	6.0
	Week 2	P2-00027	4/14/2008	4/15/2008	9/15/2008	1	2	5.0E+07	25	1245.2	1	49.8
	Week 3	P2-00047	4/21/2008	4/22/2008	12/1/2008	1	10	1.0E+07	26	259.0	2	19.9
	Week 4	P2-00066	4/28/2008	4/29/2008	12/29/2008	1	50	2.0E+06	41	81.7	6	12.0
		P2-00205	4/29/2008	4/30/2008	1/19/2009	1	50	2.0E+06	33	65.7	9	17.9
		P2-00207		4/30/2008	1/20/2009	1	50	2.0E+06	25	49.8	0	0.0
		P2-00208		4/30/2008	1/20/2009	40	50	5.0E+04	0	0.0	0	0.0
TP-OVERFLOW	Week 5	P2-00091	5/6/2008	5/7/2008	1/21/2009	2	50	1.0E+06	28	27.9	4	4.0
	Week 6	P2-00110	5/13/2008	5/14/2008	9/10/2008	5	25	8.0E+05	29	23.1	5	4.0
	Week 7	P2-00310	5/20/2008	5/21/2008	9/13/2008	17	10	5.9E+05	27	15.8	7	4.1
	Week 8	P2-00328	5/26/2008	5/27/2008	10/27/2008	10	25	4.0E+05	26	10.4	3	1.2
	Week 9	P2-00343	6/3/2008	6/4/2008	12/12/2008	13	25	3.1E+05	28	8.6	5	1.5
	Week 10	P2-00357	6/9/2008	6/10/2008	12/5/2008	31	50	6.4E+04	25	1.6	4	0.3
	Week 11	P2-00372	6/16/2008	12/5/2008	12/15/2008	15	50	1.3E+05	25	3.3	5	0.7
	Week 5	P2-00098	5/7/2008	5/7/2008	1/26/2009	14	50	1.4E+05	25	3.6	0	0.0
	Week 6	P2-00109	5/13/2008	5/14/2008	8/18/2008	20	25	2.0E+05	25	5.0	1	0.2
	Week 7	P2-00309	5/20/2008	5/21/2008	9/13/2008	38	10	2.6E+05	25	6.6	3	0.8
	Week 8	P2-00327	5/26/2008	5/27/2008	10/20/2008	36	25	1.1E+05	26	2.9	2	0.2
	Week 9	P2-00341	6/2/2008	6/4/2008	11/11/2008	40	50	5.0E+04	1	0.0	0	0.0
	Week 10	P2-00356	6/9/2008	6/10/2008	12/4/2008	40	50	5.0E+04	8	0.4	3	0.1
	Week 11	P2-00371	6/16/2008	12/5/2008	12/15/2008	20	100	5.0E+04	1	0.0	0	0.0

TABLE 2-9. PHASE II PART A ELEMENT 2 SUMMARY OF ASBESTOS RESULTS FOR SURFACE WATER

Station ID	Event	Index ID	Sample Date	Filter Prep Date	Analysis Date	GOs Counted	Volume Applied to Filter (mL)	Sensitivity (1/L)	Total LA		LA > 10 µm in length	
									N Structures	Water Conc. (MFL)	N Structures	Water Conc. (MFL)
TP-TOE1	Week 1	P2-00006	4/7/2008	4/9/2008	6/5/2008	40	50	5.0E+04	1	0.0	0	0.0
	Week 2	P2-00026	4/14/2008	4/15/2008	9/11/2008	40	50	5.0E+04	10	0.5	0	0.0
	Week 3	P2-00046	4/21/2008	4/22/2008	11/26/2008	40	50	5.0E+04	10	0.5	4	0.2
	Week 4	P2-00065	4/28/2008	4/29/2008	12/26/2008	40	50	5.0E+04	13	0.6	2	0.1
	Week 5	P2-00089	5/6/2008	5/7/2008	1/21/2009	40	50	5.0E+04	4	0.2	1	0.0
	Week 6	P2-00108	5/12/2008	5/13/2008	8/27/2008	5	100	2.0E+05	29	5.8	5	1.0
	Week 7	P2-00308	5/20/2008	5/21/2008	9/12/2008	31	10	3.2E+05	25	8.0	3	1.0
	Week 8	P2-00326	5/26/2008	5/27/2008	10/3/2008	5	25	8.0E+05	31	24.7	2	1.6
	Week 9	P2-00340	6/2/2008	6/4/2008	11/10/2008	3	100	3.3E+05	30	10.0	3	1.0
	Week 10	P2-00355	6/9/2008	6/10/2008	12/4/2008	40	50	5.0E+04	0	0.0	0	0.0
	Week 11	P2-00369	6/16/2008	12/5/2008	12/15/2008	50	25	8.0E+04	0	0.0	0	0.0
URC-1A	Week 1	P2-00010	4/8/2008	4/9/2008	6/17/2008	40	50	5.0E+04	1	0.0	0	0.0
	Week 2	P2-00029	4/14/2008	4/15/2008	9/22/2008	50	10	2.0E+05	0	0.0	0	0.0
	Week 3	P2-00051	4/22/2008	4/23/2008	12/4/2008	20	100	5.0E+04	0	0.0	0	0.0
	Week 4	P2-00069	4/28/2008	4/29/2008	1/5/2009	40	50	5.0E+04	1	0.0	0	0.0
	Week 5	P2-00095	5/6/2008	5/7/2008	1/22/2009	50	25	8.0E+04	0	0.0	0	0.0
	Week 6	P2-00113	5/13/2008	5/14/2008	11/20/2008	20	100	5.0E+04	1	0.0	0	0.0
	Week 7	P2-00312	5/20/2008	5/21/2008	9/16/2008	40	50	5.0E+04	1	0.0	1	0.0
	Week 8	P2-00333	5/27/2008	5/28/2008	10/31/2008	20	100	5.0E+04	0	0.0	0	0.0
	Week 9	P2-00346	6/3/2008	6/4/2008	12/11/2008	20	100	5.0E+04	0	0.0	0	0.0
	Week 10	P2-00361	6/10/2008	12/4/2008	12/11/2008	40	50	5.0E+04	0	0.0	0	0.0
	Week 11	P2-00375	6/17/2008	6/18/2008	9/24/2008	50	50	4.0E+04	0	0.0	0	0.0
URC-2	Week 1	P2-00011	4/8/2008	4/9/2008	7/10/2008	40	50	5.0E+04	12	0.6	3	0.1
	Week 2	P2-00028	4/14/2008	4/15/2008	9/19/2008	50	5	4.0E+05	6	2.4	2	0.8
	Week 3	P2-00050	4/22/2008	4/23/2008	12/3/2008	20	100	5.0E+04	6	0.3	1	0.0
	Week 4	P2-00068	4/28/2008	4/29/2008	12/31/2008	40	50	5.0E+04	4	0.2	0	0.0
	Week 5	P2-00094	5/6/2008	5/7/2008	1/22/2009	12	50	1.7E+05	27	4.5	4	0.7
	Week 6	P2-00111	5/13/2008	5/14/2008	9/16/2008	36	100	2.8E+04	25	0.7	6	0.2
	Week 7	P2-00311	5/20/2008	5/21/2008	9/14/2008	40	50	5.0E+04	6	0.3	2	0.1
	Week 8	P2-00331	5/27/2008	5/28/2008	10/30/2008	20	100	5.0E+04	1	0.0	0	0.0
	Week 9	P2-00345	6/3/2008	6/4/2008	12/11/2008	20	100	5.0E+04	0	0.0	0	0.0
	Week 10	P2-00360	6/10/2008	12/4/2008	12/11/2008	3	10	3.3E+06	38	126.2	2	6.6
	Week 11	P2-00374	6/17/2008	6/18/2008	9/25/2008	20	100	5.0E+04	0	0.0	0	0.0

All samples analyzed by TEM in basic accordance with EPA Method TEM ISO 10312 (EFA = 1295 mm²; GO area = 0.013 mm²).

Filter preparation laboratory = EMSL19 & EMSL27; TEM analysis laboratory = EMSL19 & EMSL27

mL = milliliters

L = liter

mm = millimeter

µm = micron

GO = grid opening

LA = Libby amphibole

MFL = million fibers per liter

TEM = transmission electron microscopy

EFA = effective filter area

EPA = U.S. Environmental Protection Agency

TABLE 2-10. PHASE II PART A ELEMENT 3 SUMMARY OF ASBESTOS RESULTS FOR SURFACE WATER

StationID	Event	Index ID	Sample Date	Filter Prep Date	Analysis Date	GOs Counted	Volume Applied to Filter (mL)	Sensitivity 1/L	Total LA		LA > 10 µm in length	
									N Structures	Water Conc. (MFL)	N Structures	Water Conc. (MFL)
LRC-2	1	P2-00459	6/30/2008	12/15/2008	12/15/2008	11	100	9.1E+04	25	2.3	4	0.4
	2	P2-00802	7/15/2008	12/18/2008	12/22/2008	13	100	7.7E+04	25	1.9	7	0.5
	3	P2-00805	7/29/2008	12/18/2008	12/28/2008	8	100	1.2E+05	30	3.7	8	1.0
	4	P2-00807	8/18/2008	12/23/2008	12/26/2008	19	50	1.0E+05	26	2.7	8	0.8
LRC-6	1	P2-00458	6/30/2008	12/15/2008	12/15/2008	4	100	2.5E+05	25	6.2	4	1.0
	2	P2-00800	7/15/2008	12/18/2008	12/22/2008	7	100	1.4E+05	28	4.0	8	1.1
	3	P2-00804	7/29/2008	12/18/2008	12/24/2008	20	100	5.0E+04	17	0.8	5	0.2
	4	P2-00806	8/18/2008	12/23/2008	12/26/2008	11	100	9.1E+04	25	2.3	5	0.5
CC-2*	1	P2-00460	6/30/2008	12/15/2008	12/16/2008	20	100	5.0E+04	0	0.0	0	0.0

*A sample was incorrectly collected from station CC-2 the first week of sampling (this location is not part of Element 3).

All samples analyzed by TEM in basic accordance with EPA Method TEM ISO 10312 (EFA = 1295 mm²; GO area = 0.013 mm²).

Filter preparation laboratory = EMSL Mobile Laboratory; TEM analysis laboratory = EMSL27

mL = milliliters

L = liter

mm = millimeter

µm = micron

EFA = effective filter area

EPA = U.S. Environmental Protection Agency

GO = grid opening

ISO = International Organization for Standardization

LA = Libby amphibole

MFL = million fibers per liter

N = number

TEM = transmission electron microscopy

TABLE 2-11. PHASE II PART A KOOTENAI RIVER SUMMARY OF ASBESTOS RESULTS FOR SURFACE WATER

Station ID	Event	Index ID	Sample Date	Filter Prep Date	Analysis Date	GOs Counted	Volume Applied to Filter (mL)	Sensitivity 1/L	Total LA		LA > 10 um in length	
									N Structures	Water Conc. (MFL)	N Structures	Water Conc. (MFL)
UKR	Low Flow	P2-00849	8/19/2008	12/26/2008	12/31/2008	20	100	5.0E+04	0	0.0	0	0
KR-1	Low Flow	P2-00847	8/19/2008	12/26/2008	12/31/2008	20	100	5.0E+04	2	0.10	0	0
KR-2	Low Flow	P2-00846	8/19/2008	12/26/2008	12/31/2008	20	100	5.0E+04	0	0.0	0	0
KR-3	Low Flow	P2-00845	8/19/2008	12/26/2008	12/31/2008	20	100	5.0E+04	0	0.0	0	0
KR-4	Low Flow	P2-00840	8/19/2008	12/26/2008	12/31/2008	20	100	5.0E+04	0	0.0	0	0
KR-5	Low Flow	P2-00841	8/19/2008	12/26/2008	12/31/2008	20	100	5.0E+04	1	0.05	1	0.05
KR-6	Low Flow	P2-00842	8/19/2008	12/26/2008	12/31/2008	20	100	5.0E+04	0	0.0	0	0
KR-7	Low Flow	P2-00843	8/19/2008	12/26/2008	12/31/2008	20	100	5.0E+04	0	0.0	0	0
KR-8	Low Flow	P2-00844	8/19/2008	12/26/2008	12/31/2008	20	100	5.0E+04	0	0.0	0	0

All samples analyzed by TEM in basic accordance with EPA Method TEM ISO 10312 (EFA = 1295 mm²; GO area = 0.013 mm²).

Filter preparation laboratory = EMSL Mobile Laboratory; TEM analysis laboratory = EMSL27

mL = milliliters

L = liter

mm = millimeter

um = micron

GO = grid opening

LA = Libby amphibole

MFL = million fibers per liter

TEM = transmission electron microscopy

EFA = effective filter area

EPA = U.S. Environmental Protection Agency

TABLE 2-12. PHASE II PART A ELEMENT 1 SUMMARY OF FIELD MEASUREMENTS FOR SURFACE WATER

Station ID	Sample Date	Temperature (°C)	pH	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Oxidation/Reduction Potential (mV)	Turbidity (NTU)
CC-1	6/28/2008	9.46	8.17	0.584	8.17	160	7.2
	9/14/2008	6.62	7.85	0.58	7.9	153	0.6
CC-2	6/25/2008	9.84	8.37	0.63	8.68	99	13.4
	6/30/2008	11.04	8.51	0.669	10.71	92	4.7
	9/10/2008	7.97	8.47	0.677	7.68	89	4.4
CC-POND	6/28/2008	17.86	8.03	0.507	9.62	108	1.9
	9/13/2008	14.44	7.64	0.588	6.14	97	1.6
CCS-1	6/28/2008	11.31	8	0.772	5.97	162	18.4
	9/13/2008	11.13	7.55	0.744	6.38	82	6.8
CCS-11	6/29/2008	9.14	8.28	0.668	3.9	124	7.3
	9/12/2008	16.3	7.48	0.659	4.19	118	3.9
	9/12/2008	16.3	7.48	0.659	4.19	118	3.9
CCS-14	6/29/2008	10.92	8.55	0.596	7.82	141	11.5
	9/12/2008	16.71	6.87	0.624	5.47	121	8
	9/12/2008	16.71	6.87	0.624	5.47	121	8
CCS-16	6/28/2008	13.3	8.37	0.913	6.8	156	4.8
	9/14/2008	10.53	7.43	0.853	7.54	64	3.7
CCS-6	6/28/2008	11.68	5.97	0.845	7.47	140	3.1
	9/13/2008	9.18	7.65	0.783	6.4	82	7.3
CCS-8	6/28/2008	12.61	8.63	0.81	9.94	155	1.5
	9/13/2008	12.16	7.64	0.81	4.97	94	0.6
CCS-9	6/29/2008	8.36	7.67	0.778	5.58	170	1.9
	9/13/2008	8.52	6.87	0.741	7.28	129	1.2
FC-1	6/27/2008	8.06	9.81	0.249	10.62	137	6.5
	9/12/2008	12.15	8.19	0.503	5.12	96	8.6
	9/12/2008	12.15	8.19	0.503	5.12	96	8.6
FC-2	6/27/2008	8.43	9.25	0.513	12.37	109	4.4
	9/12/2008	9.35	7.81	0.493	5.62	69	7
	9/12/2008	9.35	7.81	0.493	5.62	69	7
FC-POND	6/27/2008	20.14	8.89	0.412	10.62	123	3.7
	9/12/2008	16.36	8.15	0.356	5.32	74	77.4
LRC-1	6/25/2008	14.93	7.74	0.487	8.92	127	0
	9/10/2008	13.59	8.03	0.445	5.63	114	1.1
LRC-2	6/30/2008	17.27	8.18	0.495	8.98	88	1.3
	7/1/2008	18	7.92	0.415	6.97	94	1.7
	9/9/2008	14.47	8.58	0.476	9.61	32	3.6
LRC-3	6/24/2008	14.56	8.12	0.514	7.87	79	14.6
	9/9/2008	10.86	8.14	0.545	9.26	58	1.3
LRC-4	6/24/2008	13.83	8.55	0.514	8.14	65	7.3
	9/9/2008	9.93	8.31	0.544	5.56	82	1.4

TABLE 2-12. PHASE II PART A ELEMENT 1 SUMMARY OF FIELD MEASUREMENTS FOR SURFACE WATER

Station ID	Sample Date	Temperature (°C)	pH	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Oxidation/Reduction Potential (mV)	Turbidity (NTU)
LRC-5	6/24/2008	13.48	8.65	0.513	8.06	88	0
	9/9/2008	9.29	8.36	0.538	6.11	48	4.5
LRC-6	6/24/2008	12.94	8.73	0.508	8.32	37	0
	6/30/2008	13.96	7.9	0.528	9.95	69	3.9
MP	9/9/2008	8.85	7.86	5.4	5.81	141	1.9
	6/25/2008	15.28	7.31	0.487	10.63	135	1.8
TP	9/10/2008	14.38	8.05	0.427	11.13	67	0.8
	6/26/2008	20.64	8.12	0.148	9.06	103	11.6
TP-TOE1	9/11/2008	9.88	7.12	0.245	5.27	183	7.3
	6/26/2008	9.67	6.71	0.463	6.22	146	31.5
TP-TOE2	9/10/2008	10.33	7.67	0.566	6.35	59	3.6
	6/25/2008	9.91	7.13	0.51	7.21	133	15.5
URC-1	9/11/2008	9.76	7.59	0.604	15.93	75	0.2
	6/27/2008	8.52	8.11	0.317	11.89	160	2
URC-1A	9/11/2008	6.66	8.28	0.345	9.97	62	0.5
	6/26/2008	7.83	8.35	0.221	12.92	77	36
URC-2	9/11/2008	6.57	7.9	0.373	6.57	85	0.3
	6/26/2008	7.69	8.03	0.292	10.23	106	32.7
UTP	9/11/2008	6.12	7.88	0.371	9.6	102	0.8
	6/29/2008	11.84	8.45	0.295	12.22	137	0.4
UTP-D	6/29/2008	14.73	8.79	0.305	12.22	134	0.4
	9/12/2008	14.12	7.2	0.321	5.39	100	7.7
UTP-S	9/12/2008	14.8	7.83	0.311	6.41	110	3.1

°C = degrees Celcius

mS/cm millisiemens per cm

mg/L = milligrams per liter

mV = millivolts

NTU = nephelometric turbidity units

TABLE 2-13. PHASE II PART A ELEMENT 2 SUMMARY OF FIELD MEASUREMENTS FOR SURFACE WATER

Station ID	Sample Date	Temperature (°C)	pH	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Oxidation/Reduction Potential (mV)	Turbidity (NTU)
CC-2	4/7/2008	3.22	8.25	0.666	11.95	88	10.5
	4/14/2008	2.48	8.24	0.6	15.08	43	66.2
	4/21/2008	1.99	8.34	0.564	11.94	150	14.9
	4/28/2008	4.41	8.83	0.547	11.9	51	40.9
	5/5/2008	8.24	7.97	0.505	9.15	166	64
	5/12/2008	8.36	6.68	0.415	6.69	254	26.7
	5/19/2008	12.8	8.3	0.427	6.89	236	26.5
	5/26/2008	10.15	8.36	0.443	11.04	92	20.9
	6/2/2008	11.36	8.11	0.508	9.76	74	10.2
	6/9/2008	9.36	8.28	0.548	7.64	108	12
	6/16/2008	10.34	8.5	0.578	7.6	99	33.6
CC-POND	5/6/2008	7.89	6.84	0.393	8.68	271	50.3
	5/12/2008	8.06	8.07	0.354	5.95	291	8.3
	5/19/2008	13.23	7.89	0.355	6.6	288	10.4
	5/27/2008	11.48	6.61	0.366	9.45	146	33
	6/3/2008	13.32	6.07	0.421	7.2	214	21
	6/10/2008	11.15	7.21	0.463	7.29	94	0
	6/17/2008	15.14	7.19	0.466	7.39	165	4.5
FC-2	4/8/2008	1.51	7.45	0.506	14	81	7.8
	4/14/2008	3.11	8.02	0.482	11.63	47	16.3
	4/22/2008	3.15	8.32	0.49	14.74	93	15.8
	4/28/2008	6.87	8.47	0.471	12.87	46	21.5
	5/7/2008	6.52	8.47	0.453	10.81	158	109
	5/13/2008	6.08	8.36	0.446	8	294	20.9
	5/20/2008	8.77	7.83	0.465	10.64	280	15.4
	5/27/2008	8.2	8.43	0.463	10.71	85	28.9
	6/3/2008	9.37	8.26	0.481	8.25	161	27.8
	6/10/2008	5.54	8.3	0.479	8.33	78	0
	6/17/2008	9	8.33	0.488	8.49	95	36.1
FC-POND	4/8/2008	0.29	8.34	0.514	7.85	99	8.5
	4/14/2008	3.15	8.2	0.473	9.07	69	10.2
	4/22/2008	5.69	7.91	0.49	10.93	113	12.4
	4/28/2008	10.52	8.43	0.491	8.43	57	8.9
	5/6/2008	13.72	7.74	0.485	9.4	166	61.6
LRC-1	4/7/2008	7.37	7.97	0.649	12.28	105	9.5
	4/14/2008	10.25	7.79	0.647	11.04	63	8
	4/21/2008	6.77	8.17	0.654	11.36	127	14.8
	4/28/2008	10.23	8.44	0.653	12.55	57	40.5
	5/5/2008	12.4	7.65	0.633	11.29	186	77.7
	5/12/2008	10.59	7.95	0.524	7.78	285	20.4

TABLE 2-13. PHASE II PART A ELEMENT 2 SUMMARY OF FIELD MEASUREMENTS FOR SURFACE WATER

Station ID	Sample Date	Temperature (°C)	pH	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Oxidation/Reduction Potential (mV)	Turbidity (NTU)
LRC-1	5/19/2008	13.98	7.84	0.484	7.43	272	30.4
	5/26/2008	11.38	7.85	0.475	11.85	107	14.8
	6/2/2008	12.57	7.85	0.473	11.48	92	4.4
	6/9/2008	11.97	7.9	0.474	8.32	115	11.4
	6/16/2008	14.2	8.01	0.475	9.04	120	45.1
LRC-2	4/7/2008	6.72	8.26	0.651	11.39	83	8.4
	4/14/2008	6.77	8.15	0.628	10.93	37	11.2
	4/21/2008	4.95	8.33	0.621	11.31	106	15.6
	4/28/2008	8.6	8.5	0.617	11.97	52	8.8
	5/5/2008	10.75	7.79	0.589	9.22	165	61.5
	5/12/2008	10.1	8.12	0.508	6.81	301	12.6
	5/19/2008	14.05	7.86	0.477	6.89	274	18.6
	5/26/2008	10.95	7.92	0.474	10.74	124	0.2
	6/2/2008	12.83	7.99	0.469	10.24	80	8.8
	6/9/2008	11.87	7.99	0.479	8.04	124	6
	6/16/2008	13.86	8.07	0.483	8.17	148	14.3
	4/8/2008	5.67	7.91	0.604	11.86	90	8.6
LRC-6	4/14/2008	6.35	6.57	0.604	11.56	104	10.9
	4/21/2008	2.88	8.48	0.599	12.07	109	14.3
	4/28/2008	6.08	8.52	0.599	11.53	42	10.6
	5/5/2008	8.87	7.64	0.582	9.1	199	40.6
	5/12/2008	9.36	8.7	0.509	6.38	260	26.1
	5/19/2008	13.46	8.54	0.483	6.46	266	17.6
	5/26/2008	10.21	8.15	0.479	10.36	109	11.1
	6/2/2008	12.04	8.24	0.483	10.25	55	9.6
	6/9/2008	10.47	8.34	0.496	7.94	104	0
	6/16/2008	10.88	7.6	0.508	7.93	167	13
	4/7/2008	7.03	7.34	0.66	13	113	29
	4/14/2008	9.97	7.48	0.646	11.06	127	32.5
MP	4/21/2008	6.79	8.1	0.659	11.04	131	11.5
	4/28/2008	12.17	8.47	0.642	12.95	42	65.2
	4/29/2008	10.77	7.24	0.658	12.2	103	87.4
	5/6/2008	11.92	7.17	0.617	11.46	202	22.1
	5/12/2008	10.97	7.72	0.524	7.74	280	19.6
	5/19/2008	14.82	7.4	0.485	7.14	314	15.6
	5/26/2008	11.71	7.75	0.475	12.57	111	22.1
	6/2/2008	13.34	7.73	0.466	13.18	140	0
	6/9/2008	12.07	7.67	0.474	8.69	112	6.4
	6/16/2008	15.23	7.98	0.473	8.03	110	19.9

TABLE 2-13. PHASE II PART A ELEMENT 2 SUMMARY OF FIELD MEASUREMENTS FOR SURFACE WATER

Station ID	Sample Date	Temperature (°C)	pH	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Oxidation/Reduction Potential (mV)	Turbidity (NTU)
TP	4/8/2008	2.07	8.37	0.112	10.02	76	10.5
	4/14/2008	9.91	8.06	0.218	9.32	8	35.1
	4/21/2008	5.62	8.21	0.322	10.82	124	14.7
	4/28/2008	11.25	7.98	0.329	12.27	31	7
	4/29/2008	11.37	5.9	0.34	11.58	112	82.3
	5/6/2008	13.43	7.51	0.343	8.33	166	44.4
	5/13/2008	10.03	8.08	0.264	7.06	301	6.7
	5/20/2008	15.35	7.3	0.228	10.78	297	0
	5/26/2008	13.14	8.08	0.207	11.57	105	22.9
	6/3/2008	15.95	7.83	0.212	8.05	189	0
	6/9/2008	14.38	8.25	0.201	8.49	74	0
	6/16/2008	19.31	8.82	0.19	9.48	64	57.2
TP-OVERFLOW	5/7/2008	12.15	7.52	0.357	8.16	213	6.6
	5/13/2008	9.9	7.55	0.293	6.08	290	11.4
	5/20/2008	16.08	6.84	0.253	9.76	299	12.2
	5/26/2008	13.47	7.96	0.221	10.84	96	7.6
	6/2/2008	16.52	7.44	0.236	9.28	75	22.1
	6/9/2008	12.42	7.87	0.262	7.66	87	0
	6/16/2008	20.14	8.29	0.237	7.63	82	23.1
TP-TOE1	4/7/2008	9.06	7.06	0.764	6.1	126	0
	4/14/2008	8.6	7.7	0.773	6.37	80	4.5
	4/21/2008	8.65	7.79	0.762	5.63	159	7.2
	4/28/2008	8.99	7.96	0.709	6.16	85	36.2
	5/6/2008	9.16	6.9	0.648	4.8	180	46.8
	5/12/2008	9.12	7.33	0.606	3.94	282	16.4
	5/20/2008	9.22	6.78	0.562	5.48	283	32.6
	5/26/2008	9.47	7.38	0.483	6.48	114	24.9
	6/2/2008	9.81	7.12	0.441	6.87	148	14.5
	6/9/2008	9.82	7.37	0.453	4.36	118	0
	6/16/2008	10	7.7	0.457	6.41	129	29.6
	4/8/2008	3.68	8.02	0.366	108.3	72	4.9
URC-1A	4/14/2008	2.69	7.95	0.343	11.47	54	8.4
	4/22/2008	2.54	8.22	0.349	11.62	111	12.5
	4/28/2008	4	8.6	0.342	14.36	51	8.8
	5/6/2008	4.67	8.27	0.244	10.26	118	82.5
	5/13/2008	4.18	8.29	0.223	7.53	275	13.1
	5/20/2008	7.14	7.3	0.177	11.51	290	22.2
	5/27/2008	6.41	7.81	0.215	10.95	117	22
	6/3/2008	7.07	8.07	0.253	8.37	173	24.3
	6/10/2008	5.35	7.9	0.271	9.19	109	0

TABLE 2-13. PHASE II PART A ELEMENT 2 SUMMARY OF FIELD MEASUREMENTS FOR SURFACE WATER

Station ID	Sample Date	Temperature (°C)	pH	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Oxidation/Reduction Potential (mV)	Turbidity (NTU)
URC-1A	6/17/2008	7.06	7.96	0.287	8.67	146	17.5
URC-2	4/8/2008	3.73	7.97	0.366	11.45	79	5.2
	4/14/2008	2.45	7.4	0.339	13.27	114	10.2
	4/22/2008	2.34	8.96	0.347	11.88	98	10.2
	4/28/2008	3.97	8.64	0.342	14.09	49	33.8
	5/6/2008	4.59	7.98	0.245	10.34	165	89.4
	5/13/2008	4.13	8.28	0.224	7.23	295	14
	5/20/2008	6.99	7.29	0.178	11.43	287	26.8
	5/27/2008	6.37	7.82	0.216	11.33	106	25.9
	6/3/2008	6.96	7.86	0.252	8.64	177	18.6
	6/10/2008	5.41	7.86	0.271	8.8	109	0
	6/17/2008	6.94	8.11	0.288	8.87	134	16.7

°C = degrees Celcius

mS/cm millisiemens per cm

mg/L = milligrams per liter

mV = millivolts

NTU = nephelometric turbidity units

TABLE 2-14. PHASE II PART A ELEMENT 3 SUMMARY OF FIELD MEASUREMENTS FOR SURFACE WATER

Station ID	Sample Date	Temperature (°C)	pH	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Oxidation/Reduction Potential (mV)	Turbidity (NTU)
Lower Rainy Creek							
LRC-2	30-Jun-08	17.27	8.18	0.495	8.98	88	1.3
	15-Jul-08	NA	NA	NA	NA	NA	NA
	29-Jul-08	17.2	8.6	0.549	8.71	160	1.5
	18-Aug-08	18.68	8.42	0.524	9.24	138	0.5
LRC-6	30-Jun-08	13.96	7.9	0.528	9.95	69	3.9
	15-Jul-08	NA	NA	NA	NA	NA	NA
	29-Jul-08	11.16	8.92	0.566	10.61	160	2.7
	18-Aug-08	12.2	8.23	0.563	10.36	152	3
Kootenai River							
KR-1	19-Aug-08	15.16	7.24	0.242	7.86	200	2
KR-2	19-Aug-08	14.52	7.32	0.243	8.43	197	2.2
KR-3	19-Aug-08	14.86	7.17	0.242	8.7	189	2.1
KR-4	19-Aug-08	13.99	8.57	0.243	8.66	126	2.3
KR-5	19-Aug-08	14.15	8.33	0.244	8.56	136	1.6
KR-6	19-Aug-08	14.18	8.2	0.241	8.52	144	1.6
KR-7	19-Aug-08	14.02	8.11	0.24	8.73	150	2.6
KR-8	19-Aug-08	15.02	7.25	0.243	8.7	163	10.4
UKR	19-Aug-08	15.23	7.69	0.241	8.79	173	1.8

°C = degrees Celcius

mS/cm millisiemens per cm

mg/L = milligrams per liter

mV = millivolts

NTU = nephelometric turbidity units

TABLE 2-15. PHASE II PART C SUMMARY OF DETECTED CHEMICALS IN SURFACE WATER

Analyte Type	Detected Analyte	Units	Surface Water Summary Statistics				
			Number of Samples		Detection Frequency	Mean ^a	Maximum Detected
			Detects	Total			
Metals (Total Recoverable)	Barium	µg/L	1	2	50%	125	200
	Calcium	µg/L	2	2	100%	31,000	45,000
	Iron	µg/L	1	2	50%	68	120
	Magnesium	µg/L	2	2	100%	10,500	17,000
	Manganese	µg/L	1	2	50%	25	40
	Sodium	µg/L	2	2	100%	3,500	4,000
	Potassium	µg/L	2	2	100%	1,500	2,000
Metals (Dissolved)	Barium	µg/L	1	2	50%	125	200
	Cadmium	µg/L	1	2	50%	0	0.2
	Calcium	µg/L	2	2	100%	31,000	46,000
	Magnesium	µg/L	2	2	100%	10,500	17,000
	Potassium	µg/L	2	2	100%	1,500	2,000
	Sodium	µg/L	2	2	100%	3,000	3,000
Water Quality Parameters	Alkalinity, Total as CaCO ₃	mg/L	2	2	100%	128	190
	Bicarbonate as HCO ₃	mg/L	2	2	100%	156	232
	Hardness as CaCO ₃	mg/L	2	2	100%	121	185
	Organic Carbon, Dissolved (DOC)	mg/L	2	2	100%	2	2
	Solids, Total Dissolved TDS @ 180 C	mg/L	2	2	100%	138	194

^(a) Non-detects evaluated at 1/2 the PQL.

Notes:

µg/L = micrograms per liter

CaCO₃ = calcium carbonate

HCO₃ = hydrogen carbonate

mg/L = milligrams per liter

N = nitrogen

PQL = practical quantitation limit

TDS = total dissolved solids

TABLE 2-16. PHASE II PART C SUMMARY OF ASBESTOS RESULTS FOR SURFACE WATER

StationID	Index ID	Sample Date	Filter Prep Date	Analysis Date	Volume Applied to Filter (mL)	GOs Counted	Sensitivity 1/L	Total LA		LA > 10 µm in length	
								N Structures	Water Conc. (MFL)	N Structures	Water Conc. (MFL)
NSY-R1	P2-01060	10/8/2008	12/29/2008	1/5/2009	100	20	5.0E+04	0	0.0	0	0.0
BTT-R1	P2-01063	10/8/2008	12/29/2008	1/6/2009	100	20	5.0E+04	0	0.0	0	0.0

All samples analyzed by TEM in basic accordance with EPA Method TEM ISO 10312 (EFA = 1295 mm²; GO area = 0.013 mm²).

Filter preparation laboratory = EMSL Mobile Laboratory; TEM analysis laboratory = EMSL27

mL = milliliters

L = liter

mm = millimeter

µm = micron

GO = grid opening

LA = Libby amphibole

MFL = million fibers per liter

TEM = transmission electron microscopy

EFA = effective filter area

EPA = U.S. Environmental Protection Agency

TABLE 2-17. PHASE II PART C SUMMARY OF FIELD MEASUREMENTS FOR SURFACE WATER

Station ID	Sample Date	Temperature (°C)	pH	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Oxidation/Reduction Potential (mV)	Turbidity (NTU)
BTT-R1	10/3/2008	9.5	8.25	326	11.6	172	--
	10/4/2009	12.8	--	336	10	--	9.9
NSY-R1	10/4/2008	4.5	--	141	11.4	230	--
	10/2/2009	6.7	--	167	10.5	--	0.16

-- = not collected (due to equipment issue) or result not legible on the hard copy documentation

°C = degrees Celcius

mg/L = milligrams per liter

mV = millivolts

NTU = nephelometric turbidity units

TABLE 2-18. PHASE IV PART B SUMMARY OF ASBESTOS RESULTS FOR SURFACE WATER

Location	Sampling Round	Sample Date	Index ID - Total	Analysis Laboratory	Analysis Date	EFA (mm ²)	Ago (mm ²)	Volume Applied to Filter (mL)	F-Factor	GO Count	Sensitivity (1/L)	All LA Structures		LA Structures > 10µm		
												Count	Conc (MFL)	Count	Conc (MFL)	
TP	Weekly Sampling	Round 1	4/19/2011	P4-50012	EMSL27	5/9/2011	1295	0.013	50	1	8	2E+05	104	26	14	3.5
		Round 2	4/26/2011	P4-50028	EMSL27	5/19/2011	1295	0.013	100	1	4	2E+05	107	27	12	3.0
		Round 3	5/3/2011	P4-50034	EMSL27	5/25/2011	1295	0.013	50	1	11	2E+05	102	18	16	2.9
		Round 4	5/10/2011	P4-50058	EMSL27	6/7/2011	1295	0.013	25	1	4	1E+06	155	154	28	28
		Round 5	5/17/2011	P4-50070	EMSL27	6/9/2011	1295	0.013	25	1	16	2E+05	100	25	7	1.7
		Round 6	5/24/2011	P4-50088	EMSL27	6/15/2011	1295	0.013	50	1	10	2E+05	101	20	9	1.8
		Round 7	5/31/2011	P4-50106	EMSL27	7/15/2011	1295	0.013	50	1	4	5E+05	144	72	32	16
		Round 8	6/7/2011	P4-50118	EMSL27	7/22/2011	1295	0.013	100	1	8	1E+05	109	14	17	2.1
		Round 9	6/14/2011	P4-50136	EMSL27	8/8/2011	1295	0.013	5	1	16	1E+06	101	126	8	10
		Round 10	6/28/2011	P4-50148	EMSL27	8/15/2011	1295	0.013	100	1	4	2E+05	123	31	23	5.7
		Round 11	7/5/2011	P4-50166	EMSL27	8/23/2011	1295	0.013	50	1	7	3E+05	101	29	10	2.8
		Round 12	7/12/2011	P4-50178	EMSL27	8/30/2011	1295	0.013	25	1	12	3E+05	100	33	10	3.3
		Round 13	7/19/2011	P4-50196	EMSL27	9/8/2011	1295	0.013	5	1	50	4E+05	2	0.8	0	0
		Round 14	7/26/2011	P4-50208	EMSL27	9/26/2011	1295	0.013	50	1	18	1E+05	100	11	5	0.55
TP	Bi-weekly Sampling	Round 15	8/9/2011	P4-50226	EMSL27	10/10/2011	1295	0.013	25	1	14	3E+05	105	30	11	3.1
		Round 16	8/23/2011	P4-50244	EMSL27	10/18/2011	1295	0.013	25	1	7	6E+05	100	57	4	2.3
		Round 17	9/6/2011	P4-50256	EMSL27	10/27/2011	1295	0.013	50	1	9	2E+05	105	23	11	2.4
		Round 18	9/20/2011	P4-50274	EMSL27	11/9/2011	1295	0.013	5	1	10	2E+06	105	209	8	16
CC-2	Weekly Sampling	Round 1	4/19/2011	P4-50006	EMSL27	5/3/2011	1295	0.013	100	1	5	2E+05	100	20	5	1.0
		Round 2	4/26/2011	P4-50025	EMSL27	5/11/2011	1295	0.013	25	1	5	8E+05	101	80	9	7.2
		Round 3	5/3/2011	P4-50037	EMSL27	5/31/2011	1295	0.013	25	1	11	4E+05	100	36	9	3.3
		Round 4	5/10/2011	P4-50055	EMSL27	6/2/2011	1295	0.013	25	1	5	8E+05	101	80	8	6.4
		Round 5	5/17/2011	P4-50067	EMSL27	6/6/2011	1295	0.013	5	1	8	2E+06	100	249	3	7.5
		Round 6	5/24/2011	P4-50085	EMSL27	6/8/2011	1295	0.013	25	1	8	5E+05	102	51	5	2.5
		Round 7	5/31/2011	P4-50097	EMSL27	6/20/2011	1295	0.013	25	1	7	6E+05	100	57	8	4.6
		Round 8	6/7/2011	P4-50115	EMSL27	7/21/2011	1295	0.013	50	1	9	2E+05	109	24	6	1.3
		Round 9	6/14/2011	P4-50133	EMSL27	8/4/2011	1295	0.013	25	1	17	2E+05	105	25	10	2.3
		Round 10	6/28/2011	P4-50145	EMSL27	8/12/2011	1295	0.013	50	1	13	2E+05	100	15	10	1.5
		Round 11	7/5/2011	P4-50163	EMSL27	8/22/2011	1295	0.013	50	1	16	1E+05	105	13	12	1.5

TABLE 2-18. PHASE IV PART B SUMMARY OF ASBESTOS RESULTS FOR SURFACE WATER

Location	Sampling Round	Sample Date	Index ID - Total	Analysis Laboratory	Analysis Date	EFA (mm ²)	Ago (mm ²)	Volume Applied to Filter (mL)	F-Factor	GO Count	Sensitivity (1/L)	All LA Structures		LA Structures > 10µm		
												Count	Conc (MFL)	Count	Conc (MFL)	
CC-2	Weekly Sampling	Round 12	7/12/2011	P4-50175	EMSL27	8/29/2011	1295	0.013	50	1	16	1E+05	100	12	7	0.87
		Round 13	7/19/2011	P4-50193	EMSL27	9/7/2011	1295	0.013	50	1	18	1E+05	102	11	14	1.5
		Round 14	7/26/2011	P4-50205	EMSL27	9/22/2011	1295	0.013	5	1	50	4E+05	96	38	17	6.8
	Bi-weekly Sampling	Round 15	8/9/2011	P4-50223	EMSL27	10/7/2011	1295	0.013	50	1	50	4E+04	19	0.76	3	0.12
		Round 16	8/23/2011	P4-50235	EMSL27	10/13/2011	1295	0.013	25	1	8	5E+05	100	50	4	2.0
		Round 17	9/6/2011	P4-50253	EMSL27	10/26/2011	1295	0.013	5	1	51	4E+05	69	27	14	5.5
		Round 18	9/20/2011	P4-50271	EMSL27	11/8/2011	1295	0.013	10	0.1	38	3E+06	104	273	10	26
		Opportunistic	11/9/2011	P4-50277 ^[a]	EMSL27	11/11/2011	1295	0.013	25	1	50	8E+04	7	0.56	0	0
LRC-2	Weekly Sampling	Round 1	4/19/2011	P4-50009	EMSL27	5/9/2011	1295	0.013	50	1	10	2E+05	101	20	13	2.6
		Round 2	4/26/2011	P4-50022	EMSL27	5/10/2011	1295	0.013	50	1	6	3E+05	103	34	9	3.0
		Round 3	5/3/2011	P4-50031	EMSL27	5/19/2011	1295	0.013	25	1	5	8E+05	116	92	25	20
		Round 4	5/10/2011	P4-50052	EMSL27	6/1/2011	1295	0.013	50	1	4	5E+05	102	51	18	9.0
		Round 5	5/17/2011	P4-50064	EMSL27	5/26/2011	1295	0.013	25	1	6	7E+05	100	66	8	5.3
		Round 6	5/24/2011	P4-50082	EMSL27	6/7/2011	1295	0.013	25	1	10	4E+05	102	41	8	3.2
		Round 7	5/31/2011	P4-50094	EMSL27	6/15/2011	1295	0.013	25	1	11	4E+05	101	37	3	1.1
		Round 8	6/7/2011	P4-50112	EMSL27	7/25/2011	1295	0.013	100	1	6	2E+05	113	19	15	2.5
		Round 9	6/14/2011	P4-50124	EMSL27	8/1/2011	1295	0.013	50	1	34	6E+04	101	6	5	0.29
		Round 10	6/28/2011	P4-50142	EMSL27	8/11/2011	1295	0.013	50	1	13	2E+05	100	15	16	2.5
		Round 11	7/5/2011	P4-50160	EMSL27	8/19/2011	1295	0.013	100	1	8	1E+05	101	13	19	2.4
		Round 12	7/12/2011	P4-50172	EMSL27	8/26/2011	1295	0.013	50	1	20	1E+05	101	10	11	1.1
		Round 13	7/19/2011	P4-50190	EMSL27	9/6/2011	1295	0.013	50	1	11	2E+05	101	18	12	2.2
		Round 14	7/26/2011	P4-50202	EMSL27	9/19/2011	1295	0.013	50	1	8	2E+05	107	27	13	3.2
	Bi-weekly Sampling	Round 15	8/9/2011	P4-50220	EMSL27	10/6/2011	1295	0.013	25	1	9	4E+05	100	44	17	7.5
		Round 16	8/23/2011	P4-50232	EMSL27	10/12/2011	1295	0.013	25	1	10	4E+05	102	41	14	5.6
		Round 17	9/6/2011	P4-50250	EMSL27	10/24/2011	1295	0.013	50	1	50	4E+04	69	2.7	6	0.24
		Round 18	9/20/2011	P4-50265	EMSL27	11/1/2011	1295	0.013	25	1	43	9E+04	100	9.3	7	0.65

TABLE 2-18. PHASE IV PART B SUMMARY OF ASBESTOS RESULTS FOR SURFACE WATER

Location	Sampling Round	Sample Date	Index ID - Total	Analysis Laboratory	Analysis Date	EFA (mm ²)	Ago (mm ²)	Volume Applied to Filter (mL)	F-Factor	GO Count	Sensitivity (1/L)	All LA Structures		LA Structures > 10µm		
												Count	Conc (MFL)	Count	Conc (MFL)	
LRC-6	Weekly Sampling	Round 1	4/19/2011	P4-50003	EMSL27	4/29/2011	1295	0.013	25	1	6	7E+05	102	68	20	13
		Round 2	4/26/2011	P4-50013	EMSL27	5/10/2011	1295	0.013	25	1	3	1E+06	104	138	20	27
		Round 3	5/3/2011	P4-50040	EMSL27	6/1/2011	1295	0.013	50	1	10	2E+05	101	20	9	1.8
		Round 4	5/10/2011	P4-50043	EMSL27	5/24/2011	1295	0.013	25	1	4	1E+06	119	119	27	27
		Round 5	5/17/2011	P4-50061	EMSL27	5/25/2011	1295	0.013	5	1	8	2E+06	111	276	22	55
		Round 6	5/24/2011	P4-50079	EMSL27	6/3/2011	1295	0.013	25	1	4	1E+06	130	130	15	15
		Round 7	5/31/2011	P4-50091	EMSL27	6/14/2011	1295	0.013	50	1	9	2E+05	110	24	8	1.8
		Round 8	6/7/2011	P4-50109	EMSL27	7/19/2011	1295	0.013	50	1	8	2E+05	103	26	8	2.0
		Round 9	6/14/2011	P4-50121	EMSL27	7/27/2011	1295	0.013	25	1	10	4E+05	100	40	14	5.6
		Round 10	6/28/2011	P4-50139	EMSL27	8/10/2011	1295	0.013	50	1	7	3E+05	103	29	10	2.8
		Round 11	7/5/2011	P4-50151	EMSL27	8/16/2011	1295	0.013	25	1	9	4E+05	100	44	14	6.2
		Round 12	7/12/2011	P4-50169	EMSL27	8/25/2011	1295	0.013	25	1	21	2E+05	103	20	16	3.0
		Round 13	7/19/2011	P4-50181	EMSL27	8/31/2011	1295	0.013	25	1	50	8E+04	0	0	0	0
		Round 14	7/26/2011	P4-50199	EMSL27	9/16/2011	1295	0.013	50	1	10	2E+05	100	20	6	1.2
	Bi-weekly Sampling	Round 15	8/9/2011	P4-50217	EMSL27	10/5/2011	1295	0.013	50	1	5	4E+05	102	41	11	4.4
		Round 16	8/23/2011	P4-50229	EMSL27	10/11/2011	1295	0.013	50	1	6	3E+05	101	34	6	2.0
		Round 17	9/6/2011	P4-50247	EMSL27	10/19/2011	1295	0.013	50	1	10	2E+05	100	20	13	2.6
		Round 18	9/20/2011	P4-50259	EMSL27	10/28/2011	1295	0.013	50	1	30	7E+04	105	7.0	14	0.93

Footnotes:

[a] Opportunistic sample collected in response to elevated levels observed in Round 18. Results have not been uploaded to the project database.

[b] In addition to the 20% of analytical results that have been fully verified, all samples have been verified for the volume applied to the filter.

EFA = Effective filter area

Ago = Area of one grid opening

GO = Grid opening

MFL = Million fibers per liter

LA = Libby amphibole

TABLE 2-19. PHASE IV PART B SURFACE WATER SAMPLING RESULTS - FREE LA AND TOTAL LA

Sample Information			Total			Free (Field-Filtered)			
Station	Sampling Round	Sample Date	Index ID	Total LA (MFL)	LA > 10µm (MFL)	Index ID	LA (MFL)	Clumps (#/L)	Syringe Volume (mL)
TP	Round 1	4/19/11	P4-50012	26	3.5	P4-50010	4.3	2.4E+05	50
	Round 2	4/26/11	P4-50028	27	3.0	P4-50029	16.4	6.1E+05	50
	Round 3	5/3/11	P4-50034	18	2.9	P4-50035	4.6	9.6E+04	50
CC-2	Round 1	4/19/11	P4-50006	20	1.0	P4-50004	--	--	--
	Round 2	4/26/11	P4-50025	80	7.2	P4-50027	84.4	0	10
	Round 3	5/3/11	P4-50037	36	3.3	P4-50039	--	--	--
LRC-2	Round 1	4/19/11	P4-50009	20	2.6	P4-50008	9.1	9.1E+04	10
	Round 2	4/26/11	P4-50022	34	3.0	P4-50024	35.6	7.0E+05	10
	Round 3	5/3/11	P4-50031	92	19.9	P4-50033	40.7	1.2E+06	10
LRC-6	Round 1	4/19/11	P4-50003	68	13.3	P4-50001	--	--	--
	Round 2	4/26/11	P4-50013	138	26.6	P4-50017	44.8	1.3E+06	10
	Round 3	5/3/11	P4-50040	20	1.8	P4-50041	13.6	1.3E+05	50

Notes:

-- = sample not analyzed

ID = identification

L = liters

LA = Libby amphibole asbestos

MFL = million fibers per liter

mL = milliliters

µm = micrometers

TABLE 2-20. PHASE IV PART B SUMMARY OF FIELD MEASUREMENTS FOR SURFACE WATER

Station ID	Sample Date	Temperature (°C)	pH	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Oxidation/Reduction Potential (mV)	Turbidity (NTU)
CC-2	4/19/2011	2.13	7.13	0.452	3.62	260	15.3
	4/26/2011	4.64	7.24	0.39	5.02	220	25.4
	5/3/2011	5.94	7.81	0.367	3.66	165	15.6
	5/10/2011	6.4	7.01	0.288	5.82	378	19.3
	5/17/2011	7.61	6.96	0.249	5.97	76	25.8
	5/24/2011	10.73	6.69	0.303	5.08	482	11.1
	5/31/2011	8.65	6.9	0.35	6.05	360	12.8
	6/7/2011	12.31	6.98	0.385	2.01	519	8.4
	6/14/2011	11.15	7.14	0.344	2.8	380	9.7
	6/28/2011	11.99	7.14	0.514	2.78	552	5.8
	7/5/2011	12.24	6.92	0.557	2.04	406	6.5
	7/12/2011	12.6	7.38	0.607	3.4	508	9.5
	7/19/2011	12.9	7.31	0.622	2.28	345	5.7
	7/26/2011	11.91	6.95	0.633	1.9	127	19.4
	8/9/2011	10.29	6.91	0.718	1.87	221	9.3
LRC-2	8/23/2011	10.75	7.77	0.688	1.61	179	45.1
	9/6/2011	8.44	7.24	0.698	1.43	107	15.5
	9/20/2011	7.04	8.1	0.671	1.32	171	9.1
	4/19/2011	6.34	7.26	0.509	3.55	241	7.4
	4/26/2011	8.3	7.02	0.486	3.46	226	10.3
	5/3/2011	8.21	7.3	0.474	3.12	167	7.5
	5/10/2011	8.26	6.79	0.4	2.58	386	9.7
	5/17/2011	9.1	6.87	0.299	5	84	8.5
	5/24/2011	11.64	6.73	0.338	2.33	495	5.4
	5/31/2011	9.56	6.79	0.356	2.01	359	6.6
	6/7/2011	12.02	6.69	0.393	3.96	571	6.3
	6/14/2011	10.99	6.98	0.331	4.21	396	5.6
	6/28/2011	12.1	7.03	0.409	3.28	622	4.1
	7/5/2011	13.26	6.58	0.421	1.66	407	5
	7/12/2011	14.31	7.12	0.427	3.93	507	8.1
	7/19/2011	14.71	7.01	0.445	2.87	352	6
	7/26/2011	14.14	6.49	0.45	1.65	129	5.2
LRC-6	8/9/2011	15.05	6.51	0.473	2.08	232	7
	8/23/2011	15.81	7.37	0.446	0.88	178	8
	9/6/2011	12.68	6.79	0.457	1.17	103	5.8
	9/20/2011	10.46	7.68	0.472	1.3	174	9.8

TABLE 2-20. PHASE IV PART B SUMMARY OF FIELD MEASUREMENTS FOR SURFACE WATER

Station ID	Sample Date	Temperature (°C)	pH	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Oxidation/Reduction Potential (mV)	Turbidity (NTU)
LRC-6	5/10/2011	7.65	6.44	0.421	4.07	410	24.7
	5/17/2011	9.16	6.62	0.324	4.66	124	29.2
	5/24/2011	11.67	6.71	0.362	4.51	507	14.5
	5/31/2011	9.03	6.12	0.374	5.2	386	12.1
	6/7/2011	11.81	6.22	0.414	4.74	636	12.7
	6/14/2011	10.74	6.71	0.345	4.32	407	8.7
	6/28/2011	11.72	7.01	0.432	4.11	520	11.9
	7/5/2011	12.01	5.73	0.446	3.11	413	11
	7/12/2011	14.01	6.52	0.459	4.88	512	11.4
	7/19/2011	13.88	6.76	0.477	4.11	389	10.6
	7/26/2011	13.45	5.92	0.48	1.87	157	11.1
	8/9/2011	12.89	5.35	0.504	2.64	343	10.3
	8/23/2011	13.58	6.69	0.478	2.61	192	12.9
	9/6/2011	9.86	6.22	0.489	2.11	122	6.7
	9/20/2011	8.25	6.99	0.499	1.9	194	12.7
TP	4/19/2011	7.03	7.48	0.397	3.38	228	16.2
	4/26/2011	10.36	7.35	0.388	3.77	217	8.9
	5/3/2011	8.11	7.87	0.353	3.2	159	9.5
	5/10/2011	8.5	7.21	0.292	5.51	372	6.4
	5/17/2011	7.8	7.15	0.209	7.46	71	6.6
	5/24/2011	12.28	6.91	0.224	4.36	475	4.2
	5/31/2011	10.99	7.26	0.237	6.36	347	6.2
	6/7/2011	14.95	7.26	0.247	4.26	484	6.2
	6/14/2011	13.64	6.99	0.204	2.35	365	5.4
	6/28/2011	16.7	7.31	0.183	2.28	489	3.1
	7/5/2011	19.53	7.73	0.183	1.48	378	7
	7/12/2011	20.16	7.91	0.174	2.11	482	11.9
	7/19/2011	21.95	7.7	0.171	2.03	328	10.2
	7/26/2011	19.65	7.66	0.164	1.52	115	15.3
	8/9/2011	21.17	7.36	0.156	1.48	182	21
	8/23/2011	20.35	8.55	0.151	1.18	147	8.7
	9/6/2011	15.91	7.9	0.163	1.04	63	8.5
	9/20/2011	11.78	8.26	0.196	1.57	161	16.9

°C = degrees Celcius

mS/cm = millisiemens per cm

mg/L = milligrams per liter

mV = millivolts

NTU = nephelometric turbidity units

TABLE 2-21. PHASE V PART A SUMMARY OF ASBESTOS RESULTS FOR SURFACE WATER

Station ID	Sampling Round ^a	Index ID	Sample Date	Filter Prep Date	Analysis Laboratory	Analysis Date	EFA (mm ²)	GO Size (mm ⁻²)	GOs Counted	Volume Applied to Filter (mL)	Sensitivity (1/L)	Total LA		LA > 10 µm in length	
												N Structures	Water Conc. (MFL)	N Structures	Water Conc. (MFL)
KR-4 (Kootenai River, further downstream of LRC)	Round 1	P5-10002	4/25/2012	4/25/2012	EMSL27	5/16/2012	360	0.013	77	20	1.8E+05	0	0.0E+00	0	0.0E+00
	Round 2	P5-10008	5/2/2012	5/2/2012	EMSL27	10/3/2012	360	0.013	85	20	1.6E+05	0	0.0E+00	0	0.0E+00
	Round 3	P5-10015	5/9/2012	7/15/2013	EMSL04	7/29/2013	360	0.0132	76	20	1.8E+05	0	0.0E+00	0	0.0E+00
	Round 4	P5-10030	5/16/2012	5/21/2012	EMSL22	6/4/2012	1295	0.013	27	75	4.9E+04	2	9.8E-02	1	4.9E-02
	Round 5	P5-10051	5/23/2012	6/4/2012	EMSL04	7/24/2012	1295	0.0132	40	50	4.9E+04	0	0.0E+00	0	0.0E+00
	Round 6	P5-10059	5/30/2012	6/11/2012	EMSL27	6/25/2012	360	0.013	26	25	4.3E+04	0	0.0E+00	0	0.0E+00
	Round 7	P5-10066	6/6/2012	6/20/2012	EMSL27	6/26/2012	360	0.013	29	20	4.8E+04	25	1.2E+00	2	9.5E-02
	Round 8	P5-10073	6/13/2012	6/20/2012	EMSL27	6/27/2012	360	0.013	31	25	3.6E+04	0	0.0E+00	0	0.0E+00
	Round 9	P5-10093	9/19/2012	12/21/2012	EMSL27	12/27/2012	360	0.013	25	25	4.4E+04	0	0.0E+00	0	0.0E+00
KR-5 (Kootenai River, downstream of KR-4)	Round 3	P5-10013	5/9/2012	5/9/2012	EMSL27	5/25/2012	360	0.013	77	20	1.8E+05	0	0.0E+00	0	0.0E+00
	Round 4	P5-10029	5/16/2012	5/21/2012	EMSL22	6/1/2012	1295	0.013	27	75	4.9E+04	5	2.5E-01	2	9.8E-02
	Round 5	P5-10049	5/23/2012	6/4/2012	EMSL04	6/28/2012	1295	0.0132	20	100	4.9E+04	0	0.0E+00	0	0.0E+00
	Round 6	P5-10058	5/30/2012	6/11/2012	EMSL27	6/25/2012	360	0.013	26	25	4.3E+04	1	4.3E-02	0	0.0E+00
	Round 7	P5-10065	6/6/2012	6/20/2012	EMSL27	6/26/2012	360	0.013	28	25	4.0E+04	0	0.0E+00	0	0.0E+00
	Round 8	P5-10072	6/13/2012	6/20/2012	EMSL27	6/27/2012	360	0.013	26	25	4.3E+04	0	0.0E+00	0	0.0E+00
	Round 9	P5-10092	9/19/2012	12/17/2012	EMSL27	12/23/2012	360	0.013	80	25	1.4E+04	0	0.0E+00	0	0.0E+00
	Round 1	P5-10005	4/25/2012	4/25/2012	EMSL27	10/2/2012	360	0.013	85	10	3.3E+05	2	6.5E-01	0	0.0E+00
	Round 2	P5-10011	5/2/2012	5/2/2012	EMSL27	10/4/2012	360	0.013	85	20	1.6E+05	0	0.0E+00	0	0.0E+00
UKR-0 (Kootenai River, immediately upstream of the confluence with LRC)	Round 3	P5-10018	5/9/2012	7/24/2013	EMSL04	8/8/2013	1282	0.0132	76	20	6.4E+05	0	0.0E+00	0	0.0E+00
	Round 4	P5-10033	5/16/2012	5/21/2012	EMSL22	6/7/2012	1295	0.013	45	45	4.9E+04	1	4.9E-02	1	4.9E-02
	Round 5	P5-10053	5/23/2012	6/4/2012	EMSL04	6/28/2012	1295	0.0132	33	60	5.0E+04	0	0.0E+00	0	0.0E+00
	Round 9	P5-10102	9/19/2012	12/17/2012	EMSL27	12/27/2012	360	0.013	25	25	4.4E+04	1	4.4E-02	1	4.4E-02
	Round 5	P5-10054	5/23/2012	6/4/2012	EMSL04	6/28/2012	1295	0.0132	20	100	4.9E+04	0	0.0E+00	0	0.0E+00
UKR-1	Round 9	P5-10104	9/19/2012	12/17/2012	EMSL27	12/23/2012	360	0.013	80	25	1.4E+04	0	0.0E+00	0	0.0E+00
	Round 5	P5-10055	5/23/2012	6/4/2012	EMSL04	6/28/2012	1295	0.0132	20	100	4.9E+04	0	0.0E+00	0	0.0E+00
UKR-3 (previously named UKR-2)	Round 9	P5-10105	9/19/2012	12/21/2012	EMSL27	12/23/2012	360	0.013	80	25	1.4E+04	0	0.0E+00	0	0.0E+00

Notes:

All samples analyzed by TEM in basic accordance with EPA Method TEM ISO 10312

^aSamples from Events 1 through 8 were collected during high-flow conditions; Event 9 samples were collected during low flow conditions.^bSamples were collected as part of the Peristaltic Pump Pilot Study 2.

Conc. = concentration

EFA = effective filter area

EMSL = EMSL Analytical, Inc.

EPA = U.S. Environmental Protection Agency

GO = grid opening

ID = identification

ISO = International Organization for Standardization

KR = Kootenai River

L = liter

LA = Libby amphibole

LRC = lower Rainy Creek

MFL = million fibers per liter

mL = milliliters

mm = millimeter

N = number

TEM = transmission electron microscopy

UKR = upper Kootenai River

URC = upper Rainy Creek

µm = micrometer

TABLE 2-22. PHASE V PART A AVERAGE SURFACE WATER FLOW

Sampling Round	Week Ending Date	Average Flow (GPM)		
		CC-02	LRC-02	LRC-06
Round 1	4/25/12	886	6,852	7,795
Round 2	5/2/12	702	5,841	6,438
Round 3	5/9/12	438	4,209	4,534
Round 4	5/16/12	324	3,701	4,014
Round 5	5/23/12	321	3,580	3,907
Round 6	5/30/12	273	3,283	3,575
Round 7	6/6/12	348	3,102	3,325
Round 8	6/13/12	310	2,939	3,162
Round 9	9/19/12	84	665	779

Notes:

CC = Carney Creek

LRC = lower Rainy Creek

GPM = gallons per minute

TABLE 3-1. PHASE I SUMMARY OF DETECTED CHEMICALS IN SEDIMENT

Analyte Type	Detected Analyte	Units	Sediment Summary Statistics				
			Number of Samples		Detection Frequency	Mean ^a	Maximum Detected
			Detects	Total			
Metals	Aluminum	mg/kg	24	24	100%	12,419	33,800
	Arsenic	mg/kg	10	24	42%	2.1	7
	Barium	mg/kg	24	24	100%	844	4,930
	Chromium	mg/kg	24	24	100%	149	988
	Cobalt	mg/kg	23	24	96%	18.4	75
	Copper	mg/kg	24	24	100%	30.8	66
	Iron	mg/kg	24	24	100%	21,817	54,600
	Lead	mg/kg	23	24	96%	27	100
	Manganese	mg/kg	24	24	100%	1,240	12,700
	Mercury	mg/kg	2	24	8%	0.054	0.10
	Nickel	mg/kg	23	24	96%	36.9	226
	Selenium	mg/kg	4	24	17%	0.37	1.4
	Thallium	mg/kg	3	24	13%	0.5	4.3
	Vanadium	mg/kg	24	24	100%	45.5	105
	Zinc	mg/kg	24	24	100%	27.0	54
Anions	Fluoride, 1:2	mg/kg	5	24	21%	0.9	4.1
	Phosphorus, Total	mg/kg	24	24	100%	2,564	10,200
Volatile Organic Compound (VOC)	Methyl acetate	mg/kg	2	2	100%	0.31	0.37
Polycyclic Aromatic Hydrocarbons (PAHs)	Pyrene	mg/kg	1	14	7%	0.40	2.3
Hydrocarbons	C11 to C22 Aromatics	mg/kg	5	12	42%	63.4	436
	C9 to C10 Aromatics	mg/kg	1	24	4%	2.3	19
	C19 to C36 Aliphatics	mg/kg	4	12	33%	70.5	350
	C9 to C18 Aliphatics	mg/kg	2	12	17%	27.5	162
	C9 to C12 Aliphatics	mg/kg	1	24	4%	2.0	19
	Total Extractable Hydrocarbons	mg/kg	28	36	78%	180	1,240
Sediment/soil quality parameters	Total Purgeable Hydrocarbons	mg/kg	3	24	13%	2.9	19
	Carbon, Organic	wt%	24	24	100%	2.5	15.4
	Moisture	wt%	24	24	100%	39.9	86
	pH, sat. paste	s.u.	24	24	100%	7.2	8.2

^a Non-detects were evaluated at 1/2 the PQL.

Notes:

C = carbon

mg/kg = milligram per kilogram

PQL = practical quantitation limit

s.u. = standard unit

wt% = weight percent

TABLE 3-2. PHASE I SUMMARY OF ASBESTOS RESULTS FOR SEDIMENT

Reach	Station	Index ID	Sample Date	Sample Mass (g)		Sediment LA Concentration (mass percent)	
				Fine Fraction	Coarse Fraction	Fine (PLM-VE)	Coarse (PLM-Grav)
Upper Rainy Creek	URC-1	P1-00409	10/14/2007	137.7	0	ND	--
	URC-2	P1-00408	10/14/2007	123.1	47.9	<1	Tr
Tailings Impoundment	TP	P1-00407	10/14/2007	100.2	6.6	<1	Tr
	TP-TOE1	P1-00326	10/15/2007	142.2	30.6	2	0.0038
	TP-TOE2	P1-00325	10/15/2007	183.2	29	3	0.00034
Mill Pond	MP	P1-00348	10/15/2007	166.7	0	<1	--
Lower Rainy Creek	LRC-1	P1-00338	10/17/2007	210.9	44.7	<1	0.0013
	LRC-2	P1-00336	10/17/2007	256.9	36.2	<1	Tr
	LRC-3	P1-00335	10/16/2007	98.86	0	2	--
	LRC-4	P1-00329	10/16/2007	137.8	0	<1	--
	LRC-5	P1-00328	10/16/2007	129.8	35	<1	Tr
	LRC-6	P1-00327	10/16/2007	183.5	0	<1	--
Fleetwood Creek	FC-2	P1-00406	10/13/2007	203.7	14.3	Tr	ND
	FC-Pond	P1-00405	10/13/2007	89.2	0	<1	--
	FC-1	P1-00404	10/13/2007	200.9	31.2	ND	ND
Carney Creek	CC-2	P1-00399	10/12/2007	153.9	37.4	<1	0.002
	CC-1	P1-00395	10/11/2007	126.1	28.6	4	0.0052
Seeps	CCS-1	P1-00396	10/12/2007	170.2	53.3	2	Tr
	CCS-6	P1-00397	10/12/2007	163.9	21.8	2	Tr
	CCS-8	P1-00398	10/12/2007	75.6	33.6	6	0.0041
	CCS-9	P1-00400	10/12/2007	111.9	8.7	7	Tr
	CCS-11	P1-00402	10/13/2007	183.3	26.4	<1	0.002
	CCS-14	P1-00403	10/13/2007	129.6	4.1	<1	Tr
	CCS-16	P1-00289	10/15/2007	119	0	4	--

ND = not detected (Bin A)

-- = no coarse fraction

Tr = trace (Bin B1)

<1% = less than 1% (Bin B2)

PLM-VE = polarized light microscopy, visual area estimation

PLM-Grav = polarized light microscopy, gravimetric

LA = Libby amphibole

g = grams

TABLE 3-3. PHASE II PART A SUMMARY OF DETECTED CHEMICALS IN SEDIMENT

Analyte Type	Detected Analyte	Units	Sediment Summary Statistics				
			Number of Samples		Detection Frequency	Mean ^a	Maximum Detected
			Detects	Total			
Metals	Aluminum	mg/kg	108	108	100%	20,379	40,700
	Arsenic	mg/kg	37	108	34%	1.6	5
	Barium	mg/kg	108	108	100%	1,200	2,970
	Boron	mg/kg	9	108	8%	2.9	11
	Cadmium	mg/kg	4	108	4%	0.52	1
	Chromium	mg/kg	108	108	100%	265	712
	Cobalt	mg/kg	103	108	95%	32.1	75
	Copper	mg/kg	108	108	100%	53.5	175
	Iron	mg/kg	108	108	100%	31,090	62,900
	Lead	mg/kg	103	108	95%	34	88
	Manganese	mg/kg	108	108	100%	1,075	10,200
	Nickel	mg/kg	107	108	99%	66.6	146
	Thallium	mg/kg	43	108	40%	0.5	1.2
	Vanadium	mg/kg	108	108	100%	51.6	98
	Zinc	mg/kg	107	108	99%	43.2	94
Anions	Fluoride	mg/kg	31	55	56%	1.68	18
	Fluoride, 1:2	mg/kg	25	53	47%	1.8	14
	Phosphorus, Total	mg/kg	108	108	100%	2,341	8,390
VOC	Methyl acetate	mg/kg	2	4	50%	0.53	1.4
Polycyclic Aromatic Hydrocarbons (PAHs)	2-Methylnaphthalene	mg/kg	1	58	2%	0.45	2.2
	Benzo(a)anthracene	mg/kg	1	58	2%	0.45	2.2
	Benzo(a)pyrene	mg/kg	1	58	2%	0.45	2.2
	Benzo(b)fluoranthene	mg/kg	2	58	3%	0.45	2.2
	Benzo(k)fluoranthene	mg/kg	2	58	3%	0.45	2.2
	Dibenzo(a,h)anthracene	mg/kg	1	58	2%	0.45	2.2
	Fluoranthene	mg/kg	1	58	2%	0.45	2.2
	Indeno(1,2,3-cd)pyrene	mg/kg	1	58	2%	0.45	2.2
	Naphthalene	mg/kg	3	166	2%	0.28	2.8
	Phenanthrene	mg/kg	1	58	2%	0.42	2.2
	Pyrene	mg/kg	3	58	5%	0.43	2.2
	Toluene	mg/kg	1	112	1%	0.08	0.38
Hydrocarbons	C11 to C22 Aromatics	mg/kg	50	54	93%	101.4	507
	C9 to C10 Aromatics	mg/kg	14	108	13%	5.4	63
	C19 to C36 Aliphatics	mg/kg	47	54	87%	161.4	739
	C9 to C18 Aliphatics	mg/kg	34	54	63%	102.8	590
	C9 to C12 Aliphatics	mg/kg	22	108	20%	6.8	58
	Total Extractable Hydrocarbons	mg/kg	155	162	96%	399	2,360
	Total Purgeable Hydrocarbons	mg/kg	32	108	30%	17.6	276
Sediment/soil quality parameters	Carbon, Organic	wt%	108	108	100%	1.1	4.39
	Moisture	wt%	109	109	100%	50.2	84.6
	pH, sat. paste	s.u.	108	108	100%	7.1	8.3
	Solids, Total	wt%	108	108	100%	49.7	92.2

^a Non-detects were evaluated at 1/2 the PQL.

Notes:

mg/kg = milligram per kilogram

PQL = practical quantitation limit

s.u. = standard unit

wt% = weight percent

TABLE 3-4. PHASE II PART A SUMMARY OF ASBESTOS RESULTS FOR SEDIMENT

Location	Station	Sampling Event	Index ID	Sample Date	Sample Mass (g)		Sediment LA Concentration (mass percent)	
					Fine Fraction	Coarse Fraction	Fine (PLM-VE)	Coarse (PLM-Grav)
Upper Rainy Creek	URC-1	Round 1	P2-00474	6/27/2008	94.9	0	ND	--
		Round 2	P2-00994	9/14/2008	123.4	0	ND	--
	URC-1A	Round 1	P2-00473	6/27/2008	118.4	4.2	Tr	ND
		Round 2	P2-00986	9/14/2008	110.7	29.7	ND	ND
	URC-2	Round 1	P2-00472	6/27/2008	139.3	0	Tr	--
		Round 2	P2-00983	9/13/2008	98.2	0	Tr	--
Tailings Impoundment	TP-1	Round 1	P2-00477	6/27/2008	117.8	0	<1%	--
		Round 2	P2-00949	9/10/2008	96.8	0	<1%	--
	TP-2	Round 1	P2-00478	6/27/2008	82.9	0	<1%	--
		Round 2	P2-00948	9/10/2008	76.5	0	<1%	--
	TP-3	Round 1	P2-00483	6/28/2008	105.2	0	<1%	--
		Round 2	P2-00950	9/10/2008	94.3	0	2%	--
	TP-4	Round 1	P2-00482	6/28/2008	81.6	0	Tr	--
		Round 2	P2-00952	9/10/2008	96.7	0	2%	--
	TP-5	Round 1	P2-00484 b	6/28/2008	0	0	--	--
		Round 2	P2-00951	9/10/2008	115.8	0	<1%	--
	TP-6	Round 1	P2-00503	7/1/2008	129.9	0	Tr	--
		Round 2	P2-00982	9/13/2008	99.9	0	<1%	--
	TP-7	Round 1	P2-00504	7/1/2008	115.2	0	Tr	--
		Round 2	P2-00981	9/13/2008	79.1	0	2%	--
	TP-8	Round 1	P2-00505	7/1/2008	113.7	0	Tr	--
		Round 2	P2-00979	9/13/2008	87.4	0	<1%	--
	TP-9	Round 1	P2-00506	7/1/2008	98.1	0	Tr	--
		Round 2	P2-00980	9/13/2008	96	0	<1%	--
	TP-10	Round 1	P2-00507	7/1/2008	99.3	0	Tr	--
		Round 2	P2-00508 a	7/1/2008	125.4	0	Tr	--
		Round 2	P2-00975	9/12/2008	104.6	0	1%	--
	TP-11	Round 1	P2-00509	7/1/2008	109.2	0	<1%	--
		Round 2	P2-00977	9/13/2008	76.2	0	Tr	--
	TP-12	Round 1	P2-00519	7/1/2008	94	0	Tr	--
		Round 2	P2-00974	9/12/2008	108.2	0	<1%	--
	TP-13	Round 1	P2-00518	7/1/2008	112	0	<1%	--
		Round 2	P2-00969	9/12/2008	121.8	0	<1%	--
	TP-14	Round 1	P2-00517	7/1/2008	112.7	0	Tr	--
		Round 2	P2-00970	9/12/2008	99.9	0	<1%	--
	TP-15	Round 1	P2-00516	7/1/2008	122	0	Tr	--
		Round 2	P2-00971	9/12/2008	111.7	0	Tr	--
	TP-16	Round 1	P2-00515	7/1/2008	102.6	0	Tr	--
		Round 2	P2-00972	9/12/2008	92.1	0	<1%	--
	TP-17	Round 1	P2-00514	7/1/2008	101.5	0	Tr	--
		Round 2	P2-00973	9/12/2008	117.4	0	<1%	--
	TP-TOE1	Round 1	P2-00470	6/26/2008	122.1	0	<1%	--
		Round 2	P2-00968	9/12/2008	148.5	0	1%	--
	TP-TOE2	Round 1	P2-00469	6/26/2008	145.5	10.4	2%	Tr
		Round 2	P2-01010	9/10/2008	112.4	0	2%	--
Mill Pond	MP-1	Round 1	P2-00520	7/1/2008	115.2	0	Tr	--
		Round 2	P2-00963	9/11/2008	130.2	0	1%	--
	MP-2	Round 1	P2-00522	7/1/2008	43.6	0	Tr	--
		Round 2	P2-00962	9/11/2008	127	0	1%	--
	MP-3	Round 1	P2-00524	7/1/2008	127.4	0	Tr	--
		Round 2	P2-00961	9/11/2008	101.7	0	Tr	--
	MP-4	Round 1	P2-00525	7/2/2008	88.4	0	Tr	--
		Round 2	P2-00964	9/11/2008	97.1	0	1%	--
	MP-5	Round 1	P2-00526	7/2/2008	98.3	0	Tr	--
		Round 2	P2-00965	9/11/2008	109.1	0	2%	--

TABLE 3-4. PHASE II PART A SUMMARY OF ASBESTOS RESULTS FOR SEDIMENT

Location	Station	Sampling Event	Index ID	Sample Date	Sample Mass (g)		Sediment LA Concentration (mass percent)	
					Fine Fraction	Coarse Fraction	Fine (PLM-VE)	Coarse (PLM-Grav)
Lower Rainy Creek	LRC-1	Round 1	P2-00533	6/25/2008	105	0	<1%	--
		Round 2	P2-00953	9/10/2008	146.3	19.4	<1%	Tr
	LRC-2	Round 1	P2-00531	6/25/2008	120.6	0	Tr	--
		Round 2	P2-00945	9/9/2008	107.1	28.3	<1%	4.96%
	LRC-3	Round 1	P2-00466	6/25/2008	138.2	0	Tr	--
		Round 2	P2-00944	9/9/2008	158.7	0	<1%	--
	LRC-4	Round 1	P2-00465	6/25/2008	129.5	0	Tr	--
		Round 2	P2-00943	9/9/2008	136.8	0	<1%	--
	LRC-5	Round 1	P2-00464	6/25/2008	111.6	0	Tr	--
		Round 2	P2-00942	9/9/2008	149.3	8.1	<1%	Tr
Fleetwood Creek	LRC-6	Round 1	P2-00461	6/24/2008	95.3	0	<1%	--
		Round 2	P2-00941	9/9/2008	136.9	0	<1%	--
	FC-1	Round 1	P2-00481	6/28/2008	87.7	0	Tr	--
		Round 2	P2-00997	9/14/2008	106	0	Tr	--
Fleetwood Creek Pond	FC-2	Round 1	P2-00475	6/27/2008	73.3	0	Tr	--
		Round 2	P2-00995	9/14/2008	148	44.5	Tr	ND
	FC-POND-1	Round 1	P2-00496	6/30/2008	111.1	0	<1%	--
		Round 2	P2-01009	9/14/2008	116.2	0	2%	--
	FC-POND-2	Round 1	P2-00497	6/30/2008	99.3	29.8	<1%	0.39%
		Round 2	P2-00998	9/14/2008	88.2	0	<1%	--
	FC-POND-3	Round 1	P2-00498	6/30/2008	105.4	0	Tr	--
		Round 2	P2-01011	9/14/2008	89.3	0	<1%	--
	FC-POND-4	Round 1	P2-00499	6/30/2008	98.8	0	<1%	--
		Round 1	P2-00501	a	6/30/2008	94.8	0	Tr
		Round 2	P2-00999	9/14/2008	105.9	0	<1%	--
Carney Creek	FC-POND-5	Round 1	P2-00502	6/30/2008	81.7	0	<1%	--
		Round 2	P2-01008	9/14/2008	83.1	0	<1%	--
	CC-1	Round 1	P2-00490	6/29/2008	118.2	9.2	3%	Tr
		Round 2	P2-00987	9/14/2008	146.1	0	<1%	--
	CC-2	Round 1	P2-00534	6/25/2008	99.2	0	Tr	--
		Round 2	P2-00954	9/10/2008	139.6	43.6	<1%	Tr
Carney Creek Pond	CC-POND-1	Round 1	P2-00512	7/1/2008	108.5	0	<1%	--
		Round 2	P2-01013	9/15/2008	118.8	0	2%	--
	CC-POND-2	Round 1	P2-00511	7/1/2008	150.9	27.1	Tr	ND
		Round 2	P2-01014	9/15/2008	95.6	8.1	<1%	ND
	CC-POND-3	Round 1	P2-00513	7/1/2008	101.2	0	Tr	--
		Round 2	P2-01015	9/14/2008	102.9	0	<1%	--
	CC-POND-4	Round 1	P2-00536	7/2/2008	104.3	0	Tr	--
		Round 2	P2-01016	9/15/2008	92.8	0	Tr	--
	CC-POND-5	Round 1	P2-00537	7/2/2008	114.1	0	Tr	--
		Round 1	P2-00538	a	7/2/2008	105	0	Tr
		Round 2	P2-01017	9/15/2008	109.1	0	Tr	--
Seeps	CCS-1	Round 1	P2-00487	6/28/2008	114.4	0	3%	--
		Round 2	P2-00991	9/14/2008	106.3	0	1%	--
	CCS-6	Round 1	P2-00485	6/28/2008	102.7	0	<1%	--
		Round 2	P2-00990	9/14/2008	129.3	0	2%	--
	CCS-8	Round 1	P2-00486	6/28/2008	90	0	<1%	--
		Round 2	P2-00992	9/14/2008	82.2	0	1%	--
	CCS-9	Round 1	P2-00492	6/29/2008	162	10.5	2%	5.66%
		Round 2	P2-01001	9/15/2008	102.4	22.4	5%	18.56%
	CCS-11	Round 1	P2-00493	6/29/2008	116.8	4.5	Tr	Tr
		Round 2	P2-01002	9/15/2008	112.1	9.8	<1%	ND
	CCS-14	Round 1	P2-00494	6/29/2008	116.4	0	Tr	--
		Round 2	P2-01003	9/15/2008	148.5	4.5	<1%	Tr
	CCS-16	Round 1	P2-00489	6/28/2008	136.4	6.6	<1%	Tr
		Round 2	P2-00989	9/14/2008	131.5	0	2%	--

ND = not detected (Bin ND = not detected (Bin A)

-- = no coarse fraction

Tr = trace (Bin B1) Tr = trace (Bin B1)

^aDredge sample

<1% = less than 1% (Bin <1% = less than 1% (Bin B2)

^bSample not prepped; arrived at CSF without lid on container.

PLM-VE = polarized light microscopy, visual area estimation
PLM-Grav = polarized light microscopy, gravimetric

LA = Libby amphibole
g = grams

TABLE 3-5. PHASE II PART A SUMMARY OF ASBESTOS RESULTS IN KOOTENAI RIVER SEDIMENT

Location	Station	Sample Date	Index ID	Sample Mass (g)		Sediment LA Concentration (mass percent)	
				Fine Fraction	Coarse Fraction	Fine (PLM-VE)	Coarse (PLM-Grav)
Kootenai River, upstream of Rainy Creek	UKR-2	08/20/08	P2-00866	123.9	0	ND	--
Kootenai River, downstream of Rainy Creek	KR-9	08/20/08	P2-00860	101	42.9	Tr	ND
	KR-10	08/20/08	P2-00861	82.5	45	Tr	ND
	KR-11	08/20/08	P2-00862	118.5	12.3	Tr	ND
	KR-12	08/20/08	P2-00863	156.7	0	ND	--
	KR-13	08/20/08	P2-00864	116.8	0	Tr	--

ND = not detected (Bin B1) ND = not detected (Bin A)

-- = no coarse fraction

Tr = trace (Bin B1) Tr = trace (Bin B1)

<1% = less than 1% (Bin <1% = less than 1% (Bin B2)

PLM-VE = polarized light microscopy, visual area estimation

PLM-Grav = polarized light microscopy, gravimetric

LA = Libby amphibole

g = grams

TABLE 3-6. PHASE II PART C SUMMARY OF DETECTED CHEMICALS IN SEDIMENT

Analyte Type	Detected Analyte	Units	Sediment Summary Statistics				
			Number of Samples		Detection Frequency	Mean ^a	Maximum Detected
			Detects	Total			
Metals	Aluminum	mg/kg	9	10	90%	11,337	17,600
	Arsenic	mg/kg	5	10	50%	1.9	4
	Barium	mg/kg	9	10	90%	548	1,160
	Boron	mg/kg	2	10	20%	3.0	5
	Chromium	mg/kg	9	10	90%	141	358
	Cobalt	mg/kg	8	10	80%	15.9	32
	Copper	mg/kg	10	10	100%	26.8	39
	Iron	mg/kg	10	10	100%	20,803	29,000
	Lead	mg/kg	10	10	100%	14	36
	Manganese	mg/kg	10	10	100%	1,898	7,670
	Nickel	mg/kg	10	10	100%	31.8	66
	Vanadium	mg/kg	9	10	90%	42.9	69
	Zinc	mg/kg	9	10	90%	25.1	37
Sediment/soil quality parameters	Carbon, Organic	wt%	9	10	90%	1.1	3.04
	Moisture	wt%	10	10	100%	36.6	76.5
	pH, sat. paste	s.u.	9	10	90%	7.0	7.9
	Solids, Total	wt%	9	10	90%	59.8	77.3

^a Non-detects were evaluated at 1/2 the PQL.

Notes:

mg/kg = milligram per kilogram

PQL = practical quantitation limit

s.u. = standard unit

wt% = weight percent

TABLE 3-7. PHASE II PART C SUMMARY OF ASBESTOS RESULTS FOR SEDIMENT

Location	Station	Index ID	Sample Date	Sample Mass (g)		Sediment LA Concentration (mass percent)	
				Fine Fraction	Coarse Fraction	Fine (PLM-VE)	Coarse (PLM-Grav)
Upper Rainy Creek	URC-1A	P2-01076	10/2/2008	117	13.6	ND	ND
	URC-2	P2-01075	10/2/2008	104.7	0	Tr	--
Tailings Impoundment	TP-TOE2	P2-01074	10/2/2008	132	0	2%	--
		P2-01080 *	10/7/2008	106.5	4.2	3%	Tr
Lower Rainy Creek	LRC-2	P2-01071	10/1/2008	149.8	17.8	2%	2.09%
	LRC-3	P2-01072	10/2/2008	129.7	0	2%	--
	LRC-5	P2-01070	10/1/2008	128.4	10	2%	Tr
Fleetwood Creek	FC-2	P2-01077	10/2/2008	81	18.9	Tr	ND
Carney Creek	CC-1	P2-01073	10/2/2008	105.2	12.3	5%	Tr
		P2-01079 *	10/7/2008	96.5	9	5%	10.6%
Off-Site Reference	BTT-R1	P2-01078 *	10/3/2008	134.9	11.5	ND	ND
	NSY-R1	P2-01082 *	10/7/2008	150	0	ND	ND

ND = not detected (Bin A)

-- = no coarse fraction

Tr = trace (Bin B1)

* = sample used for sediment toxicity testing

<1% = less than 1% (Bin B2)

TABLE 3-8. PHASE V PART A SUMMARY OF ASBESTOS RESULTS FOR SEDIMENT

Location	Station	Sample Date	Index ID	Sample Mass (grams)	Libby Amphibole (LA)		Other Amphibole (OA)	Chrysotile (CH)	Stereomicroscopy Examination Sample Appearance
					PLM-VE Bin	Conc (%)			
KR-21 (Sandbar above confluence with Libby Creek)	KR-21	9/19/2012	P5-10084	32.8	B2	< 1%	ND	ND	Tan, nonfibrous, homogeneous
KR-20 (Sandbar below confluence with Rainy Creek)	KR-20	9/19/2012	P5-10094	25.3	B2	< 1%	ND	ND	Tan, nonfibrous, homogeneous
LK-1 (Lake Koocanusa - McGillivray campground)	LK-1	9/19/2012	P5-10106	26.9	A	ND	ND	ND	Tan, nonfibrous, homogeneous
LK-2 (Lake Koocanusa - Lake Koocanusa Marina)	LK-2	9/19/2012	P5-10107	25.9	A	ND	ND	ND	Tan, nonfibrous, homogeneous

Notes:

< 1% = less than 1%

Conc (%) = concentration as mass percent

ID = identification

ND = non-detect

PLM-VE = polarized light microscopy-visual estimation

TABLE 4-1. PHASE II PART B SUMMARY OF WELL INFORMATION FOR OU3 PROVIDED BY MWH

MWH 2007 Well I.D.	Location Description	Well Diameter (inches)	Material	Total Depth (ft. BTOC)	Surface Water Level (ft. BTOC)
A	"CCC Well" in Carney Creek drainage, upstream of pond below fine tailings	6	Steel	42.04	5.35
B	In grassy area downstream from Amphitheatre, plugged and abandoned.	8	Steel	N/A	N/A
C	In clearing across small creek south of tailings dam, upstream of watergate.	10	Steel	77.24	26.07
D	In pumphouse above (east of) tailings pond dam, potable supply well, installed in February 1986.	10	Steel	378	247.54
E	"MW-1" just off road on broad top level, ESE of pumphouse.	2	PVC	251.5	80.28
F	2-inch PVC well on edge of slope above (north of) Carney Creek	2	PVC	216.29	215.9
G	Near the headwaters of Carney Creek	Unknown	Unknown	Unknown	Unknown
H	West of Mine	2	PVC	71.12	Unknown
I	Northeast of mine within upper Fleetwood Creek drainage.	Unknown	Unknown	Unknown	Unknown
J	North of mine on hillside	Unknown	Unknown	Unknown	Unknown

ft. = feet

BTOC = Below top of casing

I.D. = identification

PVC = Polyvinyl chloride

MWH = MWH Americas, Inc.

N/A = Not available

TABLE 4-2. PHASE II PART B SUMMARY OF DETECTED CHEMICALS IN GROUNDWATER

Analyte Type	Detected Analyte	Units	Groundwater Summary Statistics				
			Number of Samples		Detection Frequency	Mean ^a	Maximum Detected
			Detects	Total			
Metals (Total Recoverable)	Aluminum	µg/L	5	13	38%	762	4,500
	Barium	µg/L	9	13	69%	292	800
	Cadmium	µg/L	5	13	38%	0.35	1.0
	Calcium	µg/L	13	13	100%	66,154	101,000
	Chromium	µg/L	2	13	15%	8.1	30
	Copper	µg/L	8	13	62%	11	69
	Iron	µg/L	11	13	85%	5,497	17,800
	Lead	µg/L	7	13	54%	2.0	8.5
	Magnesium	µg/L	13	13	100%	26,077	45,000
	Manganese	µg/L	9	13	69%	277	1,220
	Nickel	µg/L	3	13	23%	4.7	21
	Potassium	µg/L	12	13	92%	10,346	20,000
	Selenium	µg/L	1	13	8%	2.8	6.0
	Sodium	µg/L	13	13	100%	7,154	14,000
	Vanadium	µg/L	2	13	15%	8.8	40
Metals (Dissolved)	Zinc	µg/L	5	13	38%	122	1,130
	Barium	µg/L	9	13	69%	315	900
	Cadmium	µg/L	6	13	46%	0.4	1.4
	Calcium	µg/L	13	13	100%	66,385	96,000
	Copper	µg/L	3	13	23%	1.6	4.0
	Iron	µg/L	6	13	46%	1,737	10,300
	Magnesium	µg/L	13	13	100%	26,615	45,000
	Manganese	µg/L	7	13	54%	256	1,200
	Potassium	µg/L	11	13	85%	10,000	19,000
	Sodium	µg/L	13	13	100%	6,923	12,000
Anions	Vanadium	µg/L	1	13	8%	5.4	10
	Zinc	µg/L	3	13	23%	34	350
	Chloride	µg/L	13	13	100%	16,692	45,000
Nitrogen	Fluoride	µg/L	6	13	46%	188	600
	Sulfate	µg/L	12	13	92%	44,346	146,000
	Nitrogen, Nitrate as N	µg/L	9	13	69%	1,196	4,590
VOCs	Nitrogen, Nitrate+Nitrite as N	µg/L	11	13	85%	1,236	5,030
	Nitrogen, Nitrite as N	µg/L	6	13	46%	46	440
	Toluene	µg/L	2	13	15%	0.34	0.86
Hydrocarbons	Total Extractable Hydrocarbons	µg/L	4	17	24%	320	1,130
Radionuclides	Gross Alpha	pCi/L	11	13	85%	5.6	16
	Gross Beta	pCi/L	13	13	100%	10	26
Water quality parameters	Alkalinity, Total as CaCO ₃	mg/L	13	13	100%	228	339
	Bicarbonate as HCO ₃	mg/L	13	13	100%	278	413
	Hardness as CaCO ₃	mg/L	13	13	100%	277	414
	Solids, Total Dissolved TDS @ 180 C	mg/L	13	13	100%	344	524
	Solids, Total Suspended TSS @ 105 C	mg/L	5	13	38%	41	326

^(a) Non-detects evaluated at 1/2 the PQL.

Notes:

µg/L = micrograms per liter

CaCO₃ = calcium carbonate

HCO₃ = hydrogen carbonate

mg/L = milligrams per liter

N = nitrogen

pCi/L = picocuries per liter

PQL = practical quantitation limit

TDS = total dissolved solids

TABLE 4-3. PHASE II PART B SUMMARY OF ASBESTOS RESULTS FOR GROUNDWATER

StationID	Event	Index ID	Sample Date	Filter Prep Date	Analysis Date	Volume Applied to Filter (mL)	GOs Counted	Sensitivity (1/L)	Total LA		LA > 10 um in length	
									N Structures	Water Conc. (MFL)	N Structures	Conc (MFL)
Well A	Round 1	P2-00795	7/24/2008	12/18/2008	1/6/2009	10	4	2.5E+06	26	64.8	1	2.49
	Round 2	P2-01047	9/30/2008	12/29/2008	1/4/2009	25	50	8.0E+05	0	<0.8	0	<0.8
	Round 3	P2-01138	6/10/2009	6/11/2009	6/15/2009	100	20	5.0E+04	0	<0.05	0	<0.05
Well C	Round 1	P2-00780	7/22/2008	12/18/2008	12/22/2008	100	20	5.0E+04	2	0.1	0	<0.05
	Round 2	P2-01041	9/29/2008	12/29/2008	1/2/2009	100	20	5.0E+04	0	<0.05	0	<0.05
	Round 3	P2-01130	6/9/2009	6/10/2009	6/12/2009	100	20	5.0E+04	1	0.1	0	<0.05
Well D	Round 1	P2-00787	7/23/2008	12/18/2008	12/23/2008	25	50	8.0E+05	0	<0.8	0	<0.8
	Round 2	P2-01050	9/30/2008	12/29/2008	1/4/2009	50	50	4.0E+05	0	<0.4	0	<0.4
	Round 3	P2-01136	6/10/2009	6/11/2009	6/15/2009	100	20	5.0E+04	0	<0.05	0	<0.05
Well E	Round 1	P2-00789	7/23/2008	12/18/2008	12/30/2008	100	1	1.0E+06	34	33.9	2	1.99
	Round 2	P2-01045	9/30/2008	12/29/2008	1/4/2009	100	1	1.0E+06	62	61.8	3	2.99
	Round 3	P2-01133	6/9/2009	6/10/2009	6/12/2009	100	20	5.0E+04	18	0.9	3	0.15
Well H	Round 1	P2-00793	7/24/2008	12/18/2008	1/5/2009	25	3	1.3E+06	31	41.2	2	2.66
	Round 2	--	--	--	--	--	--	--	--	--	--	--
	Round 3	P2-01139	6/10/2009	6/11/2009	6/15/2009	100	5	2.0E+05	27	5.4	1	0.2

All samples analyzed by TEM in basic accordance with EPA Method TEM ISO 10312 (EFA = 1295 mm²; GO area = 0.013 mm²).

Filter preparation laboratory = EMSL Mobile Laboratory; TEM analysis laboratory = EMSL27

-- = Not sampled

mL - milliliter

L = liter

GO = grid opening

LA = Libby amphibole

MFL = million fibers per liter

TABLE 4-4. PHASE II PART B SUMMARY OF FIELD MEASUREMENTS FOR GROUNDWATER

Station ID	Sample Date	Temperature (°C)	pH	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Oxidation/Reduction Potential (mV)	Turbidity (NTU)	Volume Evacuated (gal)	Flow Rate (gal/min)
Well A	24-Jul-08	9.23	9.55	0.661	1.61	25	2000	25	0
Well A	30-Sep-08	8.95	6.71	0.456	6.63	-50	41.3	5	0
Well C	22-Jul-08	10.06	7.89	0.465	5.76	170	1	10.8	0.3
Well C	29-Sep-08	10.21	7.1	0.618	3.29	79	1.8	6	0.3
Well D	23-Jul-08	11.05	9.79	0	2.31	155	149	45	0.75
Well D	30-Sep-08	10.65	8.5	0.375	0.41	-218	66.7	6	0.3
Well E	23-Jul-08	11.31	8.13	0.813	6.33	161	4.3	11	0.5
Well E	30-Sep-08	13.58	7.77	0.783	2.61	-98	15.9	8.75	0.25
Well H	24-Jul-08	13.61	7.21	0.336	7.86	193	739	1	0

°C = degrees Celcius

mS/cm millisiemens per cm

mg/L = milligrams per liter

mV = millivolts

NTU = nephelometric turbidity units

gal = gallon

gal/min = gallon per minute

TABLE 5-1. PHASE I MINE WASTE SAMPLE LOCATIONS

Station ID	Description
MS-1	Rainy Creek road material
MS-2	Rainy Creek road material
MS-3	Rainy Creek road material
MS-4	Tailings Impoundment
MS-5	Tailings Impoundment
MS-6	Coarse Tailings Disposal Area
MS-7	Coarse Tailings Disposal Area
MS-8	Coarse Tailings Disposal Area
MS-9	Coarse Tailings Disposal Area
MS-10	Cover Material
MS-11	Cover Material
MS-12	Cover Material
MS-13	Cover Material
MS-14	Waste Rock Pile (central)
MS-15	Waste Rock Pile (west)
MS-16	Waste Rock Pile (west)
MS-17	Waste Rock Pile (central)
MS-18	Waste Rock Pile (central)
MS-19	Waste Rock Pile (east)
MS-20	Waste Rock Pile (east)
MS-21	Cover Material
MS-22	Cover Material
MS-23	Cover Material
MS-24	Cover Material
MS-25	Outcrop
MS-26	Waste Rock Pile (west)
MS-27	Waste Rock Pile (west)
MS-28	Waste Rock Pile (west)
MS-29	Waste Rock Pile (west)
MS-30	Waste Rock Pile (east)
MS-31	Outcrop
MS-32	Waste Rock Pile (east)
MS-33	Outcrop
MS-34	Outcrop
MS-35	Outcrop
MS-36	Outcrop
MS-37	Outcrop
MS-38	Outcrop

Notes: See Figure 5-1 for a map of locations.

TABLE 5-2. PHASE I SUMMARY OF DETECTED CHEMICALS IN SOIL AND MINE WASTE

Analyte Type	Detected Analyte	Units	Mine Waste/Soil Summary Statistics				
			Number of Samples		Detection Frequency	Mean ^a	Maximum Detected
			Detects	Total			
Metals	Aluminum	mg/kg	38	38	100%	17,874	50,900
	Antimony	mg/kg	1	38	3%	0.15	0.30
	Arsenic	mg/kg	4	38	11%	1.2	3.0
	Barium	mg/kg	38	38	100%	917	3,200
	Chromium	mg/kg	38	38	100%	218	881
	Cobalt	mg/kg	38	38	100%	27	63
	Copper	mg/kg	37	38	97%	31	109
	Iron	mg/kg	38	38	100%	24,905	51,900
	Lead	mg/kg	36	38	95%	19	50
	Manganese	mg/kg	38	38	100%	357	808
	Mercury	mg/kg	1	38	3%	0.06	0.30
	Nickel	mg/kg	38	38	100%	57	135
	Thallium	mg/kg	3	38	8%	0.34	0.90
	Vanadium	mg/kg	38	38	100%	39	114
	Zinc	mg/kg	38	38	100%	27	70
Anions	Fluoride, 1:2	mg/kg	2	38	5%	1	5
	Phosphorus, Total	mg/kg	38	38	100%	2,733	11,700
Polycyclic Aromatic Hydrocarbons (PAHs)	Benzo(a)anthracene	mg/kg	2	6	33%	0.128	0.210
	Benzo(a)pyrene	mg/kg	1	6	17%	0.127	0.210
	Benzo(b)fluoranthene	mg/kg	1	6	17%	0.129	0.210
	Benzo(g,h,i)perylene	mg/kg	1	6	17%	0.126	0.210
	Benzo(k)fluoranthene	mg/kg	1	6	17%	0.125	0.210
	Chrysene	mg/kg	2	6	33%	0.126	0.210
	Indeno(1,2,3-cd)pyrene	mg/kg	1	6	17%	0.130	0.210
	Pyrene	mg/kg	2	6	33%	0.132	0.210
Pesticide	Pentachlorophenol	mg/kg	1	4	25%	0.126	0.250
VOCs	Methyl acetate	mg/kg	2	2	100%	1.1	1.7
Hydrocarbons	C11 to C22 Aromatics	mg/kg	5	6	83%	33	78
	C19 to C36 Aliphatics	mg/kg	6	6	100%	80	154
	C5 to C8 Aliphatics	mg/kg	1	30	3%	0.8	1.4
	C9 to C10 Aromatics	mg/kg	1	30	3%	1.3	16
	C9 to C18 Aliphatics	mg/kg	2	6	33%	17	53
	Toluene	mg/kg	1	32	3%	0.022	0.066
	Total Extractable Hydrocarbons	mg/kg	28	36	78%	80	474
	Total Purgeable Hydrocarbons	mg/kg	3	30	10%	1.5	17
Sediment/soil quality parameters	Carbon, Organic	wt%	38	38	100%	0.6	3
	Moisture	wt%	38	38	100%	8.7	33
	pH, sat. paste	s.u.	38	38	100%	7.7	9

(a) Non-detects evaluated at 1/2 the PQL.

Notes:

mg/kg = milligram per kilogram

PQL = practical quantitation limit

s.u. = standard unit

wt% = weight percent

TABLE 5-3. PHASE I SUMMARY OF ASBESTOS RESULTS FOR SOIL AND MINE WASTE

Material Type	Station ID	Index ID	Sample Date	Sample Mass (g)		LA Concentration (mass percent)	
				Fine Fraction	Coarse Fraction	Fine (PLM-VE)	Coarse (PLM-Grav)
Road	MS-1	P1-00370	10/11/2007	124.3	54	<1	Tr
	MS-2	P1-00371	10/11/2007	161.2	19.5	<1	Tr
	MS-3	P1-00372	10/11/2007	164.8	83.3	Tr	Tr
Tailings Impoundment	MS-4	P1-00332	10/18/2007	124.1	44	<1	Tr
	MS-5	P1-00357	10/17/2007	133.7	1.41	<1	Tr
Coarse Tailings	MS-6	P1-00355	10/16/2007	174.5	27.8	<1	0.0027
	MS-7	P1-00294	10/16/2007	155.9	32.5	2	0.01
	MS-8	P1-00330	10/16/2007	130.8	11.8	<1	Tr
	MS-9	P1-00356	10/16/2007	143.1	31	<1	0.0058
Cover Material	MS-10	P1-00366	10/12/2007	184.4	42.8	<1	0.00086
	MS-11	P1-00367	10/12/2007	130.9	12	<1	0.00066
	MS-12	P1-00369	10/12/2007	183.2	23.1	<1	0.026
	MS-13	P1-00365	10/12/2007	154.7	7.3	Tr	Tr
	MS-21	P1-00378	10/13/2007	183.6	5	<1	Tr
	MS-22	P1-00379	10/13/2007	142.8	19.5	<1	0.0043
	MS-23	P1-00340	10/13/2007	103.6	16.3	ND	Tr
	MS-24	P1-00353	10/14/2007	149.6	24.4	2	0.014
Waste Rock	MS-14	P1-00345	10/13/2007	153.4	6.9	<1	0.037
	MS-15	P1-00206	10/17/2007	142.7	4.5	5	Tr
	MS-16	P1-00205	10/17/2007	192.5	27.5	2	0.0052
	MS-17	P1-00343	10/13/2007	150	26.6	<1	0.011
	MS-18	P1-00352	10/14/2007	163	15.5	<1	0.019
	MS-19	P1-00341	10/13/2007	109.8	4	<1	0.0082
	MS-20	P1-00350	10/14/2007	101.9	15.6	<1	Tr
	MS-26	P1-00292	10/15/2007	139.6	30.7	3	0.0021
	MS-27	P1-00299	10/15/2007	172.9	40.8	<1	0.019
	MS-28	P1-00290	10/15/2007	156.8	22.8	<1	0.033
	MS-29	P1-00298	10/15/2007	119.2	72.9	2	0.013
	MS-30	P1-00342	10/13/2007	174.9	27.1	<1	0.0028
	MS-32	P1-00351	10/14/2007	159.2	16.3	<1	0.017
Outcrop	MS-25	P1-00362	10/12/2007	135.3	9.1	8	0.017
	MS-31	P1-00389	10/13/2007	187.4	32	<1	0.0075
	MS-33	P1-00364	10/12/2007	95.3	38.4	<1	0.0016
	MS-34	P1-00344	10/13/2007	179.8	52.1	<1	0.0054
	MS-35	P1-00363	10/12/2007	166.1	30.6	Tr	0.000065
	MS-36	P1-00375	10/12/2007	226.6	14.9	<1	0.0034
	MS-37	P1-00376	10/12/2007	121.6	17.7	<1	0.0021
	MS-38	P1-00377	10/12/2007	123.2	65.5	<1	0.0039

ND = not detected (Bin A)

trace = present, but too small to be weighed gravimetrically

Tr = trace (Bin B1)

<1% = less than 1% (Bin B2)

**TABLE 5-4. SUMMARY OF ASBESTOS RESULTS FOR SOIL UNDER POST
REMOVAL CONDITIONS AT THE AMPHITHEATER**
Libby Asbestos Superfund Site

Index ID	Sample Date	Sample Mass (g)		Soil LA Concentration (mass percent)	
		Fine	Coarse	Fine (PLM-VE)	Coarse (PLM-Grav)
VW-1-01	11/5/2012	105.6	12.1	< 1	0.000073
VW-1-02	11/5/2012	111.4	11.7	< 1	Tr
VW-1-03	11/5/2012	87.3	0	< 1	--
VW-1-04	11/6/2012	92	0	< 1	--
VW-1-05	11/5/2012	91.9	0	Tr	--
VW-1-06	11/5/2012	92.5	0	< 1	--
VW-1-007	6/25/2013	86.1	0	1	--
VW-1-008	6/25/2013	94.6	0	< 1	--
VW-1-009	6/25/2013	89.8	0	< 1	--
VW-1-010	6/25/2013	90.5	0	2	--
VW-1-011	6/25/2013	91.4	0	< 1	--
VW-1-012	6/25/2013	92	0	< 1	--
VW-1-013	6/28/2013	86.7	0	< 1	--
VW-1-014	6/28/2013	81.9	0	2	--
VW-1-015	7/9/2013	106.9	24.2	2	Tr

-- No coarse fraction

Notes:

ND - non-detect (Bin A)

Tr - Trace (Bin B1)

<1 - less than 1% (Bin B2)

g - grams

ID - identification

LA - Libby amphibole

PLM-Grav - polarized light microscopy - gravimetric

PLM-VE - polarized light microscopy - visual area estimation

TABLE 6-1. PHASE I TREE BARK AND DUFF SAMPLE LOCATIONS

Transect ID	Description
SL15 ^a	30 degrees counterclockwise from approximate primary downwind direction. Sample at half-mile intervals along 8-mile transect (16 samples).
SL45	SL45 Approximate downwind direction. Sample at half-mile intervals along 8-mile transect (16 samples)
SL75	30 degrees clockwise from approximate primary downwind direction. Sample at half-mile intervals along 8-mile transect (12 samples ^b).
SL135	SL135 Across-gradient from primary downwind direction. Sample at half-mile intervals along 4-mile transect (8 samples)
SL195	SL195 Generally upwind of mine area/possibly downwind from Screening Plant. Sample at half-mile intervals along 6-mile transect (10 samples ^b).
SL255	SL255 Approximate upwind direction from mine area. Sample at half-mile intervals along 6-mile transect (11 samples ^b)
SL315	SL315 Across-gradient from primary downwind direction. Sample at half-mile intervals along 4-mile transect (8 samples).

^a "15" refers to degrees from due north.

^b Some sample locations eliminated due to mine waste and Kootenai River.

TABLE 6-2. PHASE I SUMMARY OF ASBESTOS RESULTS FOR TREE BARK

Transect ID	Station ID	Approx. Distance from Mine (miles)	Index ID	Sample Date	Sensitivity (1/cm ²)	Total LA	
						N Structures	Surface Loading (Ms/cm ²)
SL15 30° counterclock- wise from approximate primary downwind direction.	SL15-02	1	P1-00219	10/11/2007	5.8E+04	58	3.36
	SL15-03	1.5	P1-00223	10/11/2007	2.0E+04	61	1.24
	SL15-04	2	P1-00090	10/5/2007	3.1E+05	53	16.2
	SL15-05	2.5	P1-00099	10/5/2007	2.0E+04	51	1.04
	SL15-06	3	P1-00121	10/5/2007	3.1E+04	53	1.62
	SL15-07	3.5	P1-00097	10/4/2007	3.2E+04	50	1.61
	SL15-08	4	P1-00095	10/4/2007	9.0E+03	16	0.14
	SL15-09	4.5	P1-00123	10/4/2007	9.0E+03	10	0.09
	SL15-10	5	P1-00067	10/4/2007	9.0E+03	4	0.04
	SL15-11	5.5	P1-00063	10/3/2007	9.5E+03	0	0.00
	SL15-12	6	P1-00045	10/3/2007	9.7E+03	0	0.00
	SL15-13	6.5	P1-00057	10/2/2007	9.5E+03	0	0.00
	SL15-14	7	P1-00043	10/2/2007	9.5E+03	0	0.00
	SL15-15	7.5	P1-00061	10/2/2007	1.3E+04	0	0.00
	SL15-16	8	P1-00041	10/2/2007	9.5E+03	0	0.00
SL45 Approximate downwind from mine area.	SL45-01	0.5	P1-00201	10/12/2007	6.0E+04	70	4.22
	SL45-02	1	P1-00221	10/11/2007	1.5E+04	57	0.86
	SL45-03	1.5	P1-00225	10/11/2007	2.9E+04	55	1.59
	SL45-04	2	P1-00142	10/5/2007	6.1E+04	62	3.79
	SL45-05	2.5	P1-00071	10/4/2007	5.1E+03	8	0.04
	SL45-06	3	P1-00084	10/4/2007	3.4E+04	50	1.70
	SL45-07	3.5	P1-00039	10/3/2007	1.1E+05	51	5.6
	SL45-08	4	P1-00082	10/3/2007	1.0E+04	54	0.55
	SL45-09	4.5	P1-00060	10/3/2007	9.5E+03	32	0.30
	SL45-10	5	P1-00037	10/3/2007	9.7E+03	0	0.00
	SL45-11	5.5	P1-00035	10/3/2007	9.7E+03	33	0.32
	SL45-12	6	P1-00058	10/3/2007	9.5E+03	85	0.80
	SL45-13	6.5	P1-00031	10/2/2007	9.7E+03	8	0.08
	SL45-14	7	P1-00033	10/2/2007	9.7E+03	1	0.01
	SL45-15	7.5	P1-00053	10/2/2007	9.5E+03	3	0.03
	SL45-16	8	P1-00051	10/2/2007	9.5E+03	0	0.00
SL75 30° clockwise from approximate primary downwind direction.	SL75-02	1	P1-00227	10/12/2007	7.3E+03	6	0.04
	SL75-03	1.5	P1-00229	10/12/2007	1.2E+05	108	12.9
	SL75-04	2	P1-00163	10/6/2007	8.7E+03	44	0.38
	SL75-05	2.5	P1-00107	10/6/2007	6.1E+04	66	4.03
	SL75-06	3	P1-00109	10/6/2007	7.6E+04	57	4.35
	SL75-07	3.5	P1-00167	10/6/2007	8.7E+03	6	0.05
	SL75-08	4	P1-00169	10/6/2007	8.7E+03	28	0.24
	SL75-09	4.5	P1-00127	10/5/2007	9.4E+03	36	0.34
	SL75-13	6.5	P1-00091	10/3/2007	9.0E+03	6	0.05
	SL75-14	7	P1-00065	10/3/2007	8.7E+03	13	0.11
	SL75-15	7.5	P1-00101	10/5/2007	8.7E+03	30	0.26
	SL75-16	8	P1-00129	10/5/2007	9.4E+03	9	0.08

TABLE 6-2. PHASE I SUMMARY OF ASBESTOS RESULTS FOR TREE BARK

Transect ID	Station ID	Approx. Distance from Mine (miles)	Index ID	Sample Date	Sensitivity (1/cm ²)	Total LA	
						N Structures	Surface Loading (Ms/cm ²)
SL135 Across-gradient from primary downwind direction.	SL135-01	0.5	P1-00139	10/12/2007	6.1E+04	127	7.76
	SL135-02	1	P1-00137	10/12/2007	1.2E+05	64	7.45
	SL135-03	1.5	P1-00165	10/6/2007	1.0E+05	53	5.40
	SL135-04	2	P1-00075	10/4/2007	8.1E+04	52	4.24
	SL135-05	2.5	P1-00086	10/4/2007	9.0E+03	33	0.30
	SL135-06	3	P1-00088	10/4/2007	4.7E+04	51	2.40
	SL135-07	3.5	P1-00079	10/4/2007	9.0E+03	13	0.12
	SL135-08	4	P1-00159	10/6/2007	9.4E+03	19	0.18
SL195 Generally upwind of mine area/possibly downwind from Screening Plant.	SL195-02	1	P1-00203	10/12/2007	1.1E+05	50	5.67
	SL195-03	1.5	P1-00135	10/8/2007	4.1E+04	54	2.20
	SL195-04	2	P1-00133	10/8/2007	8.7E+03	2	0.02
	SL195-05	2.5	P1-00191	10/8/2007	1.7E+04	55	0.96
	SL195-06	3	P1-00113	10/8/2007	1.5E+04	51	0.78
	SL195-07	3.5	P1-00105	10/5/2007	7.6E+03	8	0.06
	SL195-08	4	P1-00161	10/5/2007	9.4E+03	17	0.16
	SL195-10	4.5	P1-00171	10/7/2007	8.7E+03	35	0.31
	SL195-11	5	P1-00111	10/7/2007	1.1E+04	50	0.53
	SL195-12	5.5	P1-00148	10/7/2007	8.7E+03	3	0.03
	SL255-02	1	P1-00213	10/11/2007	6.0E+04	53	3.17
	SL255-03	1.5	P1-00211	10/9/2007	8.2E+03	25	0.21
SL255 Approximate upwind direction from mine area.	SL255-04	2	P1-00179	10/9/2007	1.2E+05	57	6.61
	SL255-05	2.5	P1-00175	10/9/2007	9.8E+03	51	0.50
	SL255-06	3	P1-00173	10/9/2007	1.4E+05	61	8.84
SL315 Across-gradient from primary downwind direction.	SL315-01	0.5	P1-00215	10/11/2007	1.2E+05	84	9.91
	SL315-02	1	P1-00217	10/11/2007	3.0E+04	61	1.82
	SL315-03	1.5	P1-00131	10/7/2007	2.0E+04	65	1.32
	SL315-04	2	P1-00151	10/5/2007	1.0E+04	58	0.59
	SL315-05	2.5	P1-00153	10/6/2007	9.4E+03	23	0.22
	SL315-06	3	P1-00144	10/6/2007	3.1E+04	50	1.53
	SL315-07	3.5	P1-00146	10/6/2007	8.7E+03	2	0.02
	SL315-08	4	P1-00157	10/6/2007	8.7E+03	5	0.04

cm² = square centimeter

MS/cm² = million structures per square centimeter

LA = Libby amphibole

N = number

TABLE 6-3. PHASE I SUMMARY OF ASBESTOS RESULTS FOR FOREST SOIL

Transect ID	Station ID	Approx. Distance from Mine (miles)	Index ID	Sample Date	Sample Mass (g)		Soil LA Concentration (mass percent)	
					Fine Fraction	Coarse Fraction	Fine (PLM-VE)	Coarse (PLM-Grav)
SL15 30° counterclock- wise from approximate primary downwind direction.	SL15-02	1	P1-00220	10/11/2007	120.1	17.5	Tr	ND
	SL15-03	1.5	P1-00224	10/11/2007	115.9	21.3	Tr	Tr
	SL15-04	2	P1-00141	10/5/2007	130.1	22.1	ND	ND
	SL15-05	2.5	P1-00100	10/5/2007	79.5	0	ND	--
	SL15-06	3	P1-00122	10/5/2007	97.2	4	ND	ND
	SL15-07	3.5	P1-00098	10/4/2007	132.4	16.9	ND	ND
	SL15-08	4	P1-00096	10/4/2007	153.8	5.1	ND	ND
	SL15-09	4.5	P1-00124	10/4/2007	110.4	35.7	ND	ND
	SL15-10	5	P1-00068	10/4/2007	88	23.9	ND	ND
	SL15-11	5.5	P1-00064	10/3/2007	175.2	3.7	ND	ND
	SL15-12	6	P1-00046	10/3/2007	66.6	51.9	ND	ND
	SL15-13	6.5	P1-00056	10/2/2007	119	0	ND	--
	SL15-14	7	P1-00044	10/2/2007	71.6	4.9	ND	ND
	SL15-15	7.5	P1-00062	10/2/2007	97.8	16.5	ND	ND
	SL15-16	8	P1-00042	10/2/2007	83.7	28.3	ND	ND
SL45 Approximate downwind from mine area.	SL45-01	0.5	P1-00202	10/12/2007	107.9	4.8	<1	Tr
	SL45-02	1	P1-00222	10/11/2007	109.3	7.8	ND	Tr
	SL45-03	1.5	P1-00226	10/11/2007	122.8	29.8	Tr	Tr
	SL45-04	2	P1-00143	10/5/2007	119.6	12.8	ND	ND
	SL45-05	2.5	P1-00073	10/4/2007	137.5	17.4	ND	ND
	SL45-06	3	P1-00085	10/4/2007	127.3	17.5	ND	ND
	SL45-07	3.5	P1-00040	10/3/2007	120.3	21.5	ND	ND
	SL45-08	4	P1-00083	10/3/2007	145.4	52.2	ND	ND
	SL45-09	4.5	P1-00081	10/3/2007	113.9	48.3	ND	ND
	SL45-10	5	P1-00038	10/3/2007	82.4	7.6	ND	ND
	SL45-11	5.5	P1-00036	10/3/2007	58	0	ND	--
	SL45-12	6	P1-00059	10/3/2007	118.6	11.3	ND	ND
	SL45-13	6.5	P1-00032	10/2/2007	114.8	5.4	ND	ND
	SL45-14	7	P1-00034	10/2/2007	158.4	6.8	ND	ND
	SL45-15	7.5	P1-00054	10/2/2007	113.7	27.9	ND	ND
	SL45-16	8	P1-00052	10/2/2007	86.6	3.3	ND	ND
SL75 30° clockwise from approximate primary downwind direction.	SL75-02	1	P1-00228	10/12/2007	77.9	0	Tr	--
	SL75-03	1.5	P1-00230	10/12/2007	130	16.7	ND	ND
	SL75-04	2	P1-00164	10/6/2007	136.6	44.7	Tr	ND
	SL75-05	2.5	P1-00108	10/6/2007	132.7	19.3	ND	ND
	SL75-06	3	P1-00110	10/6/2007	160	26.1	ND	ND
	SL75-07	3.5	P1-00168	10/6/2007	102	14.2	ND	ND
	SL75-08	4	P1-00170	10/6/2007	126.8	16.2	ND	ND
	SL75-09	4.5	P1-00128	10/5/2007	157.8	5.4	ND	ND
	SL75-13	6.5	P1-00093	10/3/2007	167	0	ND	--
	SL75-14	7	P1-00066	10/3/2007	111	17.2	ND	ND
	SL75-15	7.5	P1-00103	10/5/2007	143.9	20.1	ND	ND
	SL75-16	8	P1-00130	10/5/2007	177	20.9	ND	ND

TABLE 6-3. PHASE I SUMMARY OF ASBESTOS RESULTS FOR FOREST SOIL

Transect ID	Station ID	Approx. Distance from Mine (miles)	Index ID	Sample Date	Sample Mass (g)		Soil LA Concentration (mass percent)	
					Fine Fraction	Coarse Fraction	Fine (PLM-VE)	Coarse (PLM-Grav)
SL135 Across-gradient from primary downwind direction.	SL135-01	0.5	P1-00140	10/12/2007	274.4	12.3	6	0.013
	SL135-02	1	P1-00138	10/12/2007	103.6	11.5	Tr	Tr
	SL135-03	1.5	P1-00166	10/6/2007	159.3	30.6	ND	ND
	SL135-04	2	P1-00077	10/4/2007	132.5	6.5	ND	ND
	SL135-05	2.5	P1-00087	10/4/2007	120.9	65.4	ND	ND
	SL135-06	3	P1-00089	10/4/2007	167.6	39	ND	ND
	SL135-07	3.5	P1-00080	10/4/2007	61.5	7.7	ND	ND
	SL135-08	4	P1-00160	10/6/2007	115.5	30.2	ND	ND
SL195 Generally upwind of mine area/possibly downwind from Screening Plant.	SL195-02	1	P1-00204	10/12/2007	137	3	ND	ND
	SL195-03	1.5	P1-00136	10/8/2007	170	37	ND	ND
	SL195-04	2	P1-00134	10/8/2007	90.3	33.7	ND	ND
	SL195-05	2.5	P1-00192	10/8/2007	74.6	7.2	ND	ND
	SL195-06	3	P1-00115	10/8/2007	102.1	18.4	ND	ND
	SL195-07	3.5	P1-00106	10/5/2007	104.5	11.9	ND	Tr
	SL195-08	4	P1-00162	10/5/2007	130.2	32.3	ND	ND
	SL195-10	4.5	P1-00172	10/7/2007	99.1	0	ND	--
	SL195-11	5	P1-00112	10/7/2007	90.6	4.8	ND	ND
	SL195-12	5.5	P1-00149	10/7/2007	120.5	16.2	ND	ND
	SL255-02	1	P1-00214	10/11/2007	113.6	38.6	ND	Tr
	SL255-03	1.5	P1-00212	10/9/2007	117.6	18.6	ND	ND
SL255 Approximate upwind direction from mine area.	SL255-04	2	P1-00180	10/9/2007	77.9	10.1	ND	ND
	SL255-05	2.5	P1-00177	10/9/2007	152.9	19.5	ND	ND
	SL255-06	3	P1-00174	10/9/2007	150.1	80.5	ND	Tr
SL315 Across-gradient from primary downwind direction.	SL315-01	0.5	P1-00216	10/11/2007	120.9	0	Tr	--
	SL315-02	1	P1-00218	10/11/2007	111.9	2.9	ND	ND
	SL315-03	1.5	P1-00132	10/7/2007	178.6	24.6	ND	ND
	SL315-04	2	P1-00152	10/5/2007	197.8	16.8	ND	ND
	SL315-05	2.5	P1-00155	10/6/2007	94.2	15.8	ND	ND
	SL315-06	3	P1-00145	10/6/2007	176.5	12.7	ND	ND
	SL315-07	3.5	P1-00147	10/6/2007	97.6	33	ND	ND
	SL315-08	4	P1-00158	10/6/2007	89.3	10.3	ND	ND

-- = no coarse fraction

<1% = less than 1% (Bin B2)

g = gram

LA = Libby amphibole

ND = not detected (Bin A)

PLM-VE = polarized light microscopy, visual area estimation

PLM-Grav = polarized light microscopy, gravimetric

Tr = trace (Bin B1)

TABLE 6-4. OU3 PHASE I SUMMARY OF ASBESTOS RESULTS FOR DUFF MATERIAL

Transect ID	Station ID	Approx. Distance from Mine (miles)	Index ID	Sample Date	Sensitivity (g) ⁻¹	Structure Counts and Concentrations in Duff		
						Total LA		
						N Structures	(Ms/g, dw)	(mass %)
SL15 30° counterclock- wise from approximate primary downwind direction.	SL15-02	1	P1-00220	10/11/2007	4.5E+07	50	2,230	3.65%
	SL15-03	1.5	P1-00224	10/11/2007	1.1E+07	69	787	0.29%
	SL15-04	2	P1-00141	10/5/2007	1.1E+07	57	607	0.21%
	SL15-05	2.5	P1-00100	10/5/2007	4.7E+06	9	42	0.03%
	SL15-06	3	P1-00122	10/5/2007	6.3E+06	8	50	0.06%
	SL15-07	3.5	P1-00098	10/4/2007	9.4E+06	4	37	0.001%
	SL15-08	4	P1-00096	10/4/2007	9.9E+06	6	59	0.007%
	SL15-09	4.5	P1-00124	10/4/2007	8.5E+06	4	34	0.01%
	SL15-10	5	P1-00068	10/4/2007	8.4E+06	0	0	0.0%
	SL15-11	5.5	P1-00064	10/3/2007	5.0E+06	7	35	0.01%
	SL15-12	6	P1-00046	10/3/2007	8.8E+06	1	9	0.002%
	SL15-13	6.5	P1-00056	10/2/2007	8.5E+06	0	0	0.0%
	SL15-14	7	P1-00044	10/2/2007	8.6E+06	0	0	0.0%
	SL15-15	7.5	P1-00062	10/2/2007	6.5E+06	3	19	0.002%
	SL15-16	8	P1-00042	10/2/2007	7.9E+06	0	0	0.0%
SL45 Approximate downwind from mine area.	SL45-01	0.5	P1-00202	10/12/2007	4.6E+07	70	3,204	0.84%
	SL45-02	1	P1-00222	10/11/2007	2.9E+07	105	3,082	1.74%
	SL45-03	1.5	P1-00226	10/11/2007	2.2E+07	119	2,630	4.27%
	SL45-04	2	P1-00143	10/5/2007	1.0E+07	30	299	0.13%
	SL45-05	2.5	P1-00073	10/4/2007	8.8E+06	27	238	0.08%
	SL45-06	3	P1-00085	10/4/2007	6.2E+06	16	99	0.06%
	SL45-07	3.5	P1-00040	10/3/2007	9.1E+06	48	438	0.28%
	SL45-08	4	P1-00083	10/3/2007	9.4E+06	44	414	0.10%
	SL45-09	4.5	P1-00081	10/3/2007	9.2E+06	16	148	0.08%
	SL45-10	5	P1-00038	10/3/2007	9.6E+06	9	86	0.01%
	SL45-11	5.5	P1-00036	10/3/2007	9.5E+06	11	105	0.03%
	SL45-12	6	P1-00059	10/3/2007	9.4E+06	14	131	0.42%
	SL45-13	6.5	P1-00032	10/2/2007	8.9E+06	6	54	0.003%
	SL45-14	7	P1-00034	10/2/2007	8.4E+06	4	34	0.02%
	SL45-15	7.5	P1-00054	10/2/2007	8.7E+06	1	9	0.01%
	SL45-16	8	P1-00052	10/2/2007	9.9E+06	0	0	0.0%
SL75 30° clockwise from approximate primary downwind direction.	SL75-02	1	P1-00228	10/12/2007	2.0E+07	50	1,005	0.50%
	SL75-03	1.5	P1-00230	10/12/2007	5.7E+07	55	3,146	3.52%
	SL75-04	2	P1-00164	10/6/2007	8.5E+06	12	102	0.02%
	SL75-05	2.5	P1-00108	10/6/2007	1.1E+07	51	549	0.49%
	SL75-06	3	P1-00110	10/6/2007	5.9E+06	14	82	0.01%
	SL75-07	3.5	P1-00168	10/6/2007	9.3E+06	6	56	0.52%
	SL75-08	4	P1-00170	10/6/2007	9.2E+06	6	55	0.005%
	SL75-09	4.5	P1-00128	10/5/2007	9.7E+06	10	97	0.05%
	SL75-13	6.5	P1-00093	10/3/2007	7.5E+06	0	0	0.0%
	SL75-14	7	P1-00066	10/3/2007	8.6E+06	4	34	0.002%
	SL75-15	7.5	P1-00103	10/5/2007	9.2E+06	7	64	0.003%
	SL75-16	8	P1-00130	10/5/2007	NA	NA	NA	NA

TABLE 6-4. OU3 PHASE I SUMMARY OF ASBESTOS RESULTS FOR DUFF MATERIAL

Transect ID	Station ID	Approx. Distance from Mine (miles)	Index ID	Sample Date	Sensitivity (g) ⁻¹	Structure Counts and Concentrations in Duff		
						Total LA		
						N Structures	(Ms/g, dw)	(mass %)
SL135 Across-gradient from primary downwind direction.	SL135-01	0.5	P1-00140	10/12/2007	3.5E+07	55	1,909	1.40%
	SL135-02	1	P1-00138	10/12/2007	1.1E+07	70	789	0.28%
	SL135-03	1.5	P1-00166	10/6/2007	8.2E+06	4	33	0.01%
	SL135-04	2	P1-00077	10/4/2007	7.4E+06	1	7	0.0001%
	SL135-05	2.5	P1-00087	10/4/2007	7.8E+06	4	31	0.002%
	SL135-06	3	P1-00089	10/4/2007	1.0E+07	4	40	0.001%
	SL135-07	3.5	P1-00080	10/4/2007	7.7E+06	8	61	0.02%
	SL135-08	4	P1-00160	10/6/2007	9.0E+06	2	18	0.003%
SL195 Generally upwind of mine area/possibly downwind from Screening Plant.	SL195-02	1	P1-00204	10/12/2007	3.5E+07	52	1,807	1.51%
	SL195-03	1.5	P1-00136	10/8/2007	8.2E+06	12	98	0.03%
	SL195-04	2	P1-00134	10/8/2007	4.5E+06	6	27	0.06%
	SL195-05	2.5	P1-00192	10/8/2007	7.1E+06	13	93	0.08%
	SL195-06	3	P1-00115	10/8/2007	9.0E+06	25	224	7.04%
	SL195-07	3.5	P1-00106	10/5/2007	8.5E+06	1	9	0.03%
	SL195-08	4	P1-00162	10/5/2007	9.2E+06	0	0	0.0%
	SL195-10	4.5	P1-00172	10/7/2007	9.5E+06	2	19	0.05%
	SL195-11	5	P1-00112	10/7/2007	8.8E+06	4	35	0.02%
	SL195-12	5.5	P1-00149	10/7/2007	9.7E+06	1	10	0.0001%
	SL255-02	1	P1-00214	10/11/2007	1.5E+07	51	740	1.08%
	SL255-03	1.5	P1-00212	10/9/2007	6.6E+06	55	364	0.73%
SL255 Approximate upwind direction from mine area.	SL255-04	2	P1-00180	10/9/2007	4.2E+07	53	2,230	0.66%
	SL255-05	2.5	P1-00177	10/9/2007	9.1E+06	4	36	0.06%
	SL255-06	3	P1-00174	10/9/2007	9.8E+06	2	20	0.02%
SL315 Across-gradient from primary downwind direction.	SL315-01	0.5	P1-00216	10/11/2007	5.0E+07	57	2,847	3.19%
	SL315-02	1	P1-00218	10/11/2007	1.2E+07	65	750	0.77%
	SL315-03	1.5	P1-00132	10/7/2007	8.8E+06	25	221	0.05%
	SL315-04	2	P1-00152	10/5/2007	9.8E+06	4	39	0.03%
	SL315-05	2.5	P1-00155	10/6/2007	8.5E+06	6	51	0.08%
	SL315-06	3	P1-00145	10/6/2007	8.5E+06	5	42	0.01%
	SL315-07	3.5	P1-00147	10/6/2007	9.5E+06	0	0	0.00%
	SL315-08	4	P1-00158	10/6/2007	6.1E+06	3	18	0.01%

NA = Not analyzed. Sample P1-00130 was used for ashing evaluation purposes and was not analyzed by TEM.

dw = dry weight

g = gram

LA = Libby amphibole

Ms/g = million structures per gram

N = number

TEM = transmission electron microscopy

TABLE 6-5. PHASE I SUMMARY OF TREE AGE STUDY

Transect ID	Approximate Distance From Mine (miles)	Station ID	Index ID	Sample Date	Diameter of Tree (inches)	Age of Tree (years)*	Sensitivity (1/cm ²)	N Total LA Structures	Loading (MS/cm ²)
									Total LA
SL45 Approximate downwind from mine area.	4.0	SL45-08	P1-00082	10/3/2007	8.5	51	1.0E+04	54	0.55
	8.0	SL45-16	P1-00051	10/2/2007	11.6	29	9.5E+03	0	<DL
SL15 30° counterclock-wise from approximate primary downwind direction.	5.0	SL15-10	P1-00067	10/4/2007	11	92	9.0E+03	4	0.04
	5.5	SL15-11	P1-00063	10/3/2007	8.4	100	9.5E+03	0	<DL
	7.5	SL15-15	P1-00061	10/2/2007	14.7	50	1.3E+04	0	<DL
SL75 30° clockwise from approximate primary downwind direction.	2.0	SL75-04	P1-00163	10/6/2007	8.9	79	8.7E+03	44	0.38
	6.5	SL75-16	P1-00129	10/5/2007	10.6	67	9.4E+03	9	0.08
SL195 Generally upwind of mine area/possibly downwind from Screening Plant.	2.5	SL195-05	P1-00191	10/8/2007	12.5	83	1.7E+04	55	0.96
	4.0	SL195-08	P1-00161	10/5/2007	8.15	48	9.4E+03	17	0.16
SL255 Approximate upwind direction from mine area.	2.5	SL255-05	P1-00175	10/9/2007	11.1	66	9.8E+03	51	0.50
SL135 Across-gradient from primary downwind direction.	2.5	SL135-05	P1-00086	10/4/2007	18	79	9.0E+03	33	0.30
SL315 Across-gradient from primary downwind direction.	3.0	SL315-06	P1-00144	10/6/2007	8.9	82	3.1E+04	50	1.53

*Based on number of rings

cm² = square centimeter

MS/cm² = million structures per square centimeter

LA = Libby amphibole

N = number

TABLE 6-6. PHASE I SUMMARY STATISTICS FOR METALS IN FOREST SOIL - DOWNWIND AND UPWIND/CROSS-WIND TRANSECTS

Metal	Dataset 1: Downwind Transects					Dataset 2: Upwind/Cross-wind Transects					Gehan Test p value	Comparison Conclusion
	N	% NDs	Mean (detects)	Min (detects)	Max (detects)	N	% NDs	Mean (detects)	Min (detects)	Max (detects)		
Aluminum	6	0.00%	9627	4560	26100	6	0.00%	8302	5280	17300	0.564	Do Not Reject H0, Conclude Dataset 1 <= Dataset 2
Antimony	6	100.00%	N/A	N/A	N/A	6	100.00%	N/A	N/A	N/A	N/A	All non-detect; Conclude Dataset 1 = Dataset 2
Arsenic	6	66.67%	6	6	6	6	33.33%	6.25	6	7	0.956	Do Not Reject H0, Conclude Dataset 1 <= Dataset 2
Barium	6	0.00%	94.33	46	225	6	0.00%	105.3	56	203	0.685	Do Not Reject H0, Conclude Dataset 1 <= Dataset 2
Beryllium	6	100.00%	N/A	N/A	N/A	6	100.00%	N/A	N/A	N/A	N/A	All non-detect; Conclude Dataset 1 = Dataset 2
Boron	6	83.33%	5	5	5	6	83.33%	5	5	5	0.549	Do Not Reject H0, Conclude Dataset 1 <= Dataset 2
Cadmium	6	100.00%	N/A	N/A	N/A	6	83.33%	1	1	1	0.841	Do Not Reject H0, Conclude Dataset 1 <= Dataset 2
Chromium	6	0.00%	23.83	8	49	6	0.00%	21.33	8	43	0.564	Do Not Reject H0, Conclude Dataset 1 <= Dataset 2
Cobalt	6	33.33%	11	6	26	6	16.67%	8.6	6	18	0.901	Do Not Reject H0, Conclude Dataset 1 <= Dataset 2
Copper	6	0.00%	19	9	48	6	0.00%	19.83	11	45	0.788	Do Not Reject H0, Conclude Dataset 1 <= Dataset 2
Iron	6	0.00%	17150	11100	30700	6	0.00%	16633	12800	24100	0.685	Do Not Reject H0, Conclude Dataset 1 <= Dataset 2
Lead	6	0.00%	16	8	27	6	0.00%	18	8	26	0.626	Do Not Reject H0, Conclude Dataset 1 <= Dataset 2
Manganese	6	0.00%	384.3	185	810	6	0.00%	501.2	209	1250	0.788	Do Not Reject H0, Conclude Dataset 1 <= Dataset 2
Mercury	6	100.00%	N/A	N/A	N/A	6	100.00%	N/A	N/A	N/A	N/A	All non-detect; Conclude Dataset 1 = Dataset 2
Nickel	6	0.00%	18.17	7	42	6	0.00%	14.83	9	29	0.626	Do Not Reject H0, Conclude Dataset 1 <= Dataset 2
Selenium	6	100.00%	N/A	N/A	N/A	6	100.00%	N/A	N/A	N/A	N/A	All non-detect; Conclude Dataset 1 = Dataset 2
Silver	6	100.00%	N/A	N/A	N/A	6	100.00%	N/A	N/A	N/A	N/A	All non-detect; Conclude Dataset 1 = Dataset 2
Thallium	6	100.00%	N/A	N/A	N/A	6	100.00%	N/A	N/A	N/A	N/A	All non-detect; Conclude Dataset 1 = Dataset 2
Vanadium	6	0.00%	27.83	6	119	6	0.00%	24.83	7	99	0.626	Do Not Reject H0, Conclude Dataset 1 <= Dataset 2
Zinc	6	0.00%	57	35	71	6	0.00%	56.83	47	71	0.436	Do Not Reject H0, Conclude Dataset 1 <= Dataset 2

Concentrations are reported as milligrams per kilogram (mg/kg).

N/A = not applicable

%ND = % of samples that are non-detect

Stdev = standard deviation

TABLE 6-7. PHASE I SUMMARY STATISTICS FOR METALS IN FOREST SOIL

Metal	Detection Frequency	Soil Concentration (mg/kg)		
		Average*	Minimum	Maximum
Aluminum	12/12	8,964	4,560	26,100
Antimony	0/12	5 U	--	--
Arsenic	6/12	4.3	5 U	7.0
Barium	12/12	100	46	225
Beryllium	0/12	5 U	--	--
Boron	2/12	2.9	5 U	5.0
Cadmium	1/12	0.54	1 U	1.0
Chromium	12/12	23	8.0	49
Cobalt	9/12	7.9	5 U	26
Copper	12/12	19	9.0	48
Iron	12/12	16,892	11,100	30,700
Lead	12/12	17	8.0	27
Manganese	12/12	443	185	1,250
Mercury	0/12	1 U	--	--
Nickel	12/12	17	7.0	42
Selenium	0/12	5 U	--	--
Silver	0/12	5 U	--	--
Thallium	0/12	5 U	--	--
Vanadium	12/12	26	6.0	119
Zinc	12/12	57	35	71

*Non-detects evaluated at 1/2 the detection limit.

Sample dates: October 2 to October 12, 2007

mg/kg = milligrams per kilogram

U = non-detect qualifier

TABLE 6-8. SUMMARY OF REPLICATE ASBESTOS RESULTS FOR TREE BARK AND DUFF FOR PHASE I

Panel A: Tree Bark Results

Station ID	Index ID	Replicate #1 (original-2007/2008)				Replicate #2 (2013)				Replicate #3 (2013)				Mean Surface Loading (Ms/cm ²)			
		Sensitivity (1/cm ²)	Number of GOs examined	N Total LA Structures	Surface Loading (Ms/cm ²)	Sensitivity (1/cm ²)	Number of GOs examined	N Total LA Structures	Surface Loading (Ms/cm ²)	Sensitivity (1/cm ²)	Number of GOs examined	N Total LA Structures	Surface Loading (Ms/cm ²)				
SL15-02	P1-00219	5.8E+04	1	a	58	3.4	b	1.4E+04	4	78	1.1	1.4E+04	4	98	1.4	2.0	
SL45-02	P1-00221	1.5E+04	2	a	57	0.86	b	7.5E+03	4	54	0.41	7.4E+03	4	56	0.41	0.56	
SL45-07	P1-00039	1.1E+05	6		51	5.6	c	8.7E+04	7	54	4.7	d	5.6E+04	11	52	2.9	4.4
SL45-08	P1-00082	1.0E+04	13		54	0.55		1.0E+04	12	39	0.40		1.0E+04	12	44	0.45	0.47
SL45-15	P1-00053	9.5E+03	14		3	0.028		1.0E+04	12	0	0		1.0E+04	12	0	0	0.0095
SL45-16	P1-00051	9.5E+03	14		0	0		1.0E+04	12	1	0.010		1.0E+04	12	0	0	0.0034

Panel B: Duff Results

Station ID	Index ID	Replicate #1 (original-2007/2008)				Replicate #2 (2013)				Replicate #3 (2013)				Mean Conc. (Ms/g)		
		Sensitivity (1/g)	Number of GOs examined	N Total LA Structures	Conc. (Ms/g, dw)	Sensitivity (1/g)	Number of GOs examined	N Total LA Structures	Conc. (Ms/g, dw)	Sensitivity (1/g)	Number of GOs examined	N Total LA Structures	Conc. (Ms/g, dw)			
SL15-02	P1-00220	4.5E+07	1	a	50	2,230	b	1.1E+07	4	92	1,015	1.1E+07	4	112	1,236	1,494
SL45-02	P1-00222	2.9E+07	2	a	105	3,082	b	1.4E+07	4	91	1,302	1.4E+07	4	97	1,388	1,924
SL45-07	P1-00040	9.1E+06	5		48	438	b	8.9E+06	5	30	267	8.9E+06	5	26	231	312
SL45-08	P1-00083	9.4E+06	14		44	414	b	9.3E+06	14	13	121	9.3E+06	14	12	112	216
SL45-15	P1-00054	8.7E+06	5		1	8.7		8.6E+06	5	2	17	8.6E+06	5	5	43	23
SL45-16	P1-00052	9.9E+06	5		0	0		9.8E+06	5	3	29	9.8E+06	5	2	20	16

a -- Number of GOs examined does not meet minimum ISO requirements.

b -- Replicate #1 is statistically different from Replicate #2 and Replicate #3.

c -- Replicate #1 is statistically different from Replicate #3.

d -- Replicate #2 is statistically different from Replicate #3.

Notes:

cm² - square centimeter

Conc. - concentration

GO - grid opening

g - grams

ID - identification

ISO - International Organization for Standardization

LA - Libby amphibole asbestos

Ms/cm² - million LA structures per square centimeter of bark surface area

Ms/g, dw - million LA structures per gram of duff material based on dry weight

N - number

OU - operable unit

TABLE 6-9. SUMMARY OF REPLICATE ASBESTOS RESULTS FOR TREE BARK AND DUFF FOR THE COMMERCIAL LOGGING SCENARIO

Panel A: Tree Bark Results

Station ID	Index ID	Replicate #1 (original-2012)			Replicate #2 (2013)			Replicate #3 (2013)			Mean Surface Loading (Ms/cm ²)
		Sensitivity (1/cm ²)	N Total LA Structures	Surface Loading (Ms/cm ²)	Sensitivity (1/cm ²)	N Total LA Structures	Surface Loading (Ms/cm ²)	Sensitivity (1/cm ²)	N Total LA Structures	Surface Loading (Ms/cm ²)	
CL-A	CL-3-0002	1.8E+05	52	9.5 a	2.8E+05	54	14.9	2.2E+05	56	12	12
CL-B	CL-3-0004	1.8E+04	22	0.40	2.8E+04	10	0.28 c	2.8E+04	22	0.61	0.43
CL-C	CL-3-0008	1.9E+04	32	0.60	2.8E+04	17	0.47	2.2E+04	28	0.63	0.56
CL-D	CL-3-0010	1.8E+04	39	0.72 b	2.8E+04	73	2.0	2.8E+04	57	1.6	1.4
CL-E	CL-3-0012	1.8E+04	48	0.88 b	2.8E+04	53	1.5	2.8E+04	55	1.5	1.3

Panel B: Duff Results

Station ID	Index ID	Replicate #1 (original-2012)			Replicate #2 (2013)			Replicate #3 (2013)			Mean Conc. (Ms/g)
		Sensitivity (1/g)	N Total LA Structures	Conc. (Ms/g, dw)	Sensitivity (1/g)	N Total LA Structures	Conc. (Ms/g, dw)	Sensitivity (1/g)	N Total LA Structures	Conc. (Ms/g, dw)	
CL-A	CL-3-0001	7.9E+06	78	616	7.9E+06	88	695	7.9E+06	76	600	637
CL-B	CL-3-0003	9.3E+06	66	611	9.3E+06	49	454	9.3E+06	58	537	534
CL-C	CL-3-0007	8.6E+06	26	222	8.6E+06	30	257	8.6E+06	25	214	231
CL-D	CL-3-0009	4.6E+06	39	178	4.6E+06	32	146	4.6E+06	25	114	146
CL-E	CL-3-0011	5.7E+06	64	362	5.7E+06	77	436	5.7E+06	58	328	376

a -- Replicate #1 is statistically different from Replicate #2.

b -- Replicate #1 is statistically different from Replicate #2 and Replicate #3.

c -- Replicate #2 is statistically different from Replicate #3.

Notes:

cm² - square centimeter

Conc. - concentration

g - grams

ID - identification

LA - Libby amphibole asbestos

Ms/cm² - million LA structures per square centimeter of bark surface area

Ms/g, dw - million LA structures per gram of duff material based on dry weight

N - number

TABLE 7-1. PHASE I AND PHASE II AMBIENT AIR MONITORING LOCATIONS

Station ID	Phase I	Phase II	Description
A-1	X		North of mine area.
A-2	X		Northeast of mine area (general downwind direction).
A-3	X		East of mine area
A-4	X	X	Adjacent to coarse tailings disposal area (general downwind direction).
A-5	X	X	Adjacent to central portion of mine area (general downwind direction).
A-6	X	X	Adjacent to southern portion of mine area (general downwind direction).
A-7	X		Southwest of mine area (general upwind direction).
A-8	X	X	Adjacent to mine waste areas (general upwind direction).
A-9		X	Adjacent to mine waste areas (general upwind direction).
A-10		X	Adjacent to mine waste areas (general upwind direction).
A-11		X	Adjacent to southern portion of mine area (general downwind direction).
A-12		X	Adjacent to coarse tailings disposal area (general downwind direction).

TABLE 7-2. PHASE I SUMMARY OF ASBESTOS RESULTS FOR AMBIENT AIR

Station ID	Round	Index ID	Air Volume Collected (L)	Sensitivity (cc) ⁻¹	Total LA		PCME LA	
					N Structures	Air Conc (s/cc)	N Structures	Air Conc (s/cc)
A-1	1	P1-00005	14,382	0.00056	0	0.00	0	0.00
	2	P1-00017	14,274	0.00056	0	0.00	0	0.00
	3	P1-00243	14,254	0.00045	0	0.00	0	0.00
	4	P1-00277	14,378	0.00056	0	0.00	0	0.00
A-2	1	P1-00006	14,376	0.00056	0	0.00	0	0.00
	2	P1-00018	14,262	0.00056	0	0.00	0	0.00
	3	P1-00244	14,244	0.00045	0	0.00	0	0.00
	4	P1-00278	14,375	0.00056	0	0.00	0	0.00
A-3	1	P1-00010	14,335	0.00056	0	0.00	0	0.00
	2	P1-00024	14,264	0.00056	0	0.00	0	0.00
	3	P1-00250	14,215	0.00045	0	0.00	0	0.00
	4	P1-00284	14,334	0.00056	0	0.00	0	0.00
A-4	1	P1-00007	12,974	0.00062	0	0.00	0	0.00
	2	P1-00020	14,253	0.00056	0	0.00	0	0.00
	3	P1-00245	14,077	0.00046	0	0.00	0	0.00
	4	P1-00279	14,208	0.00056	0	0.00	0	0.00
A-5	1	P1-00008	12,984	0.00062	0	0.00	0	0.00
	2	P1-00022	14,239	0.00056	0	0.00	0	0.00
	3	P1-00247	14,256	0.00045	0	0.00	0	0.00
	4	P1-00281	14,336	0.00056	0	0.00	0	0.00
A-6	1	P1-00009	14,368	0.00056	0	0.00	0	0.00
	2	P1-00023	14,214	0.00056	0	0.00	0	0.00
	3	P1-00249	14,260	0.00045	0	0.00	0	0.00
	4	P1-00283	14,356	0.00056	0	0.00	0	0.00
A-7	1	P1-00001	14,402	0.00056	0	0.00	0	0.00
	2	P1-00015	14,263	0.00056	0	0.00	0	0.00
	3	P1-00241	14,296	0.00045	0	0.00	0	0.00
	4	P1-00275	14,370	0.00056	0	0.00	0	0.00
A-8	1	P1-00003	12,915	0.00062	0	0.00	0	0.00
	2	P1-00016	9,957	0.00080	0	0.00	0	0.00
	3	P1-00242	14,290	0.00045	0	0.00	0	0.00
	4	P1-00276	14,382	0.00056	0	0.00	0	0.00

Round 1: 10/2/2007 - 10/7/2007

L = liters

Round 2: 10/7/2007 - 10/12/2007

LA = Libby amphibole

Round 3: 10/12/2007 - 10/17/2007

s/cc = structures per cubic centimeter

Round 4: 10/17/2007 - 10/22/2007

PCME = Phase Contrast Microscopy Equivalent

TABLE 7-3. PHASE II PART B SUMMARY OF ASBESTOS RESULTS FOR AMBIENT AIR

Station ID	Round	Index ID	Air Volume Collected (L)	Sensitivity (cc) ⁻¹	Total LA		PCME LA	
					N Structures	Air Conc (s/cc)	N Structures	Air Conc (s/cc)
A-4	5	P2-00608	14,154	5.2E-04	0	0.0E+00	0	0.0E+00
	6	P2-00621	14,227	5.2E-04	0	0.0E+00	0	0.0E+00
	7	P2-00632	14,039	5.3E-04	0	0.0E+00	0	0.0E+00
	8	P2-00643	14,230	5.2E-04	0	0.0E+00	0	0.0E+00
	9	P2-00653	14,345	5.2E-04	0	0.0E+00	0	0.0E+00
	10	P2-00664	14,416	5.1E-04	0	0.0E+00	0	0.0E+00
	11	P2-00674	14,214	5.2E-04	0	0.0E+00	0	0.0E+00
	12	P2-00686	14,340	5.2E-04	0	0.0E+00	0	0.0E+00
A-5	5	P2-00607	14,231	5.2E-04	0	0.0E+00	0	0.0E+00
	6	P2-00620	14,230	5.2E-04	2	1.0E-03	2	1.0E-03
	7	P2-00634	11,450	6.5E-04	1	6.5E-04	1	6.5E-04
	8	P2-00642	14,230	5.2E-04	9	4.7E-03	5	2.6E-03
	10	P2-00662	14,489	5.1E-04	1	5.1E-04	1	5.1E-04
	11	P2-00673	14,171	5.2E-04	0	0.0E+00	0	0.0E+00
	12	P2-00685	14,350	5.2E-04	0	0.0E+00	0	0.0E+00
	5	P2-00605	14,240	5.2E-04	0	0.0E+00	0	0.0E+00
A-6	6	P2-00618	14,240	5.2E-04	0	0.0E+00	0	0.0E+00
	7	P2-00629	14,396	5.1E-04	1	5.1E-04	1	5.1E-04
	8	P2-00639	12,781	5.8E-04	0	0.0E+00	0	0.0E+00
	9	P2-00649	14,413	5.1E-04	0	0.0E+00	0	0.0E+00
	10	P2-00660	12,503	5.9E-04	0	0.0E+00	0	0.0E+00
	11	P2-00671	14,226	5.2E-04	0	0.0E+00	0	0.0E+00
	12	P2-00683	14,370	5.2E-04	0	0.0E+00	0	0.0E+00
	5	P2-00610	11,436	6.5E-04	0	0.0E+00	0	0.0E+00
A-8	6	P2-00614	14,096	5.3E-04	0	0.0E+00	0	0.0E+00
	7	P2-00625	12,650	5.9E-04	0	0.0E+00	0	0.0E+00
	8	P2-00636	14,199	5.2E-04	0	0.0E+00	0	0.0E+00
	9	P2-00646	14,360	5.2E-04	0	0.0E+00	0	0.0E+00
	10	P2-00657	14,390	5.1E-04	0	0.0E+00	0	0.0E+00
	11	P2-00668	14,270	5.2E-04	0	0.0E+00	0	0.0E+00
	12	P2-00680	14,391	5.1E-04	0	0.0E+00	0	0.0E+00
	5	P2-00602	14,350	5.2E-04	0	0.0E+00	0	0.0E+00
A-9	6	P2-00615	8,101	9.1E-04	1	9.1E-04	0	0.0E+00
	7	P2-00626	14,430	5.1E-04	14	7.2E-03	11	5.6E-03
	8	P2-00637	14,233	5.2E-04	1	5.2E-04	1	5.2E-04
	9	P2-00647	14,328	5.2E-04	0	0.0E+00	0	0.0E+00
	10	P2-00658	14,523	5.1E-04	4	2.0E-03	3	1.5E-03
	11	P2-00669	12,840	5.8E-04	0	0.0E+00	0	0.0E+00
	12	P2-00681	14,370	5.2E-04	0	0.0E+00	0	0.0E+00
	5	P2-00604	14,254	5.2E-04	0	0.0E+00	0	0.0E+00
A-10	6	P2-00617	9,978	7.4E-04	0	0.0E+00	0	0.0E+00
	7	P2-00627	14,663	5.0E-04	0	0.0E+00	0	0.0E+00
	8	P2-00638	14,221	5.2E-04	0	0.0E+00	0	0.0E+00
	9	P2-00648	14,392	5.1E-04	0	0.0E+00	0	0.0E+00
	10	P2-00659	11,406	6.5E-04	0	0.0E+00	0	0.0E+00
	11	P2-00670	14,240	5.2E-04	0	0.0E+00	0	0.0E+00
	12	P2-00682	14,380	5.1E-04	0	0.0E+00	0	0.0E+00

TABLE 7-3. PHASE II PART B SUMMARY OF ASBESTOS RESULTS FOR AMBIENT AIR

Station ID	Round	Index ID	Air Volume Collected (L)	Sensitivity (cc) ⁻¹	Total LA		PCME LA	
					N Structures	Air Conc (s/cc)	N Structures	Air Conc (s/cc)
A-11	5	P2-00606	14,253	5.2E-04	0	0.0E+00	0	0.0E+00
	6	P2-00619	12,843	5.8E-04	0	0.0E+00	0	0.0E+00
	7	P2-00630	14,449	5.1E-04	8	4.1E-03	5	2.6E-03
	8	P2-00641	14,230	5.2E-04	0	0.0E+00	0	0.0E+00
	9	P2-00650	14,330	5.2E-04	0	0.0E+00	0	0.0E+00
	10	P2-00661	14,452	5.1E-04	2	1.0E-03	2	1.0E-03
	11	P2-00672	14,240	5.2E-04	0	0.0E+00	0	0.0E+00
	12	P2-00684	14,360	5.2E-04	0	0.0E+00	0	0.0E+00
A-12	5	P2-00609	14,229	5.2E-04	0	0.0E+00	0	0.0E+00
	6	P2-00622	14,216	5.2E-04	0	0.0E+00	0	0.0E+00
	7	P2-00633	14,326	5.2E-04	0	0.0E+00	0	0.0E+00
	8	P2-00644	14,190	5.2E-04	0	0.0E+00	0	0.0E+00
	9	P2-00654	14,320	5.2E-04	0	0.0E+00	0	0.0E+00
	10	P2-00665	14,406	5.1E-04	0	0.0E+00	0	0.0E+00
	11	P2-00676	14,180	5.2E-04	0	0.0E+00	0	0.0E+00
	12	P2-00687	12,876	5.8E-04	0	0.0E+00	0	0.0E+00

Round 5: 7/7/2008 - 7/12/2008

L = liters

Round 6: 7/20/2008 - 7/25/2008

LA = Libby amphibole

Round 7: 8/5/2008 - 8/10/2008

s/cc = structures per cubic centimeter

Round 8: 8/17/2008 - 8/22/2008

PCME = Phase Contrast Microscopy Equivalent

Round 9: 8/31/2008 - 9/5/2008

Round 10: 9/14/2008 - 9/19/2008

Round 11: 9/28/2008 - 10/3/2008

Round 12: 10/12/2008 - 10/17/2008

TABLE 8-1. PHASE III SUMMARY OF ASBESTOS RESULTS FOR ABS PERSONAL AIR

ABS Scenario	Approx. Distance from Mine (miles)	ABS Area	N Samples	N Total LA Detects	Total LA Detect. Freq. (%)	Mean Sensitivity (cc) ⁻¹	Mean Conc. (s/cc)	
							Total LA	PCME LA
ATV Riding	6-8	ABS-01	7	0	0%	6.0E-03	0.0E+00	0.0E+00
		ABS-02	8	0	0%	6.0E-03	0.0E+00	0.0E+00
		ABS-08	6	1	17%	6.0E-03	1.0E-03	0.0E+00
	5-6	ABS-03	7	1	14%	6.0E-03	1.7E-03	1.7E-03
		ABS-05	7	0	0%	6.0E-03	0.0E+00	0.0E+00
		ABS-11	6	1	17%	6.0E-03	1.0E-03	1.0E-03
	2-5	ABS-06	7	0	0%	6.0E-03	0.0E+00	0.0E+00
		ABS-07	8	1	13%	6.0E-03	7.5E-04	7.5E-04
		ABS-13	7	0	0%	6.0E-03	0.0E+00	0.0E+00
	0-2	ABS-10	6	4	67%	6.0E-03	1.1E-02	3.0E-03
		ABS-14	7	1	14%	6.0E-03	8.6E-04	0.0E+00
Hiking	7-8	ABS-01	6	0	0%	6.0E-03	0.0E+00	0.0E+00
		ABS-02	8	1	13%	6.0E-03	7.4E-04	0.0E+00
		ABS-08	6	0	0%	6.0E-03	0.0E+00	0.0E+00
	5-6	ABS-03	7	1	14%	6.0E-03	8.6E-04	8.6E-04
		ABS-05	7	1	14%	6.0E-03	8.6E-04	8.6E-04
		ABS-11	6	1	17%	6.0E-03	1.0E-03	1.0E-03
	2-5	ABS-06	7	1	14%	6.0E-03	1.7E-03	0.0E+00
		ABS-07	8	1	13%	6.0E-03	1.5E-03	1.5E-03
		ABS-13	7	2	29%	6.0E-03	3.4E-03	0.0E+00
	0-2	ABS-10	6	1	17%	6.0E-03	1.0E-03	0.0E+00
		ABS-14	6	1	17%	6.0E-03	1.0E-03	1.0E-03
Fire Building/Burning	7-8	ABS-01	7	3	43%	6.0E-03	2.6E-03	8.5E-04
		ABS-02	7	2	29%	6.0E-03	1.7E-03	8.5E-04
		ABS-08	6	1	17%	6.0E-03	1.0E-03	0.0E+00
	5-6	ABS-03	7	4	57%	6.0E-03	4.3E-03	2.6E-03
		ABS-05	8	4	50%	6.0E-03	4.5E-03	3.0E-03
		ABS-11	6	1	17%	6.0E-03	2.0E-03	0.0E+00
	2-5	ABS-06	7	3	43%	6.0E-03	7.6E-03	2.5E-03
		ABS-07	8	2	25%	6.0E-03	1.5E-03	7.5E-04
		ABS-13	7	2	29%	6.0E-03	3.4E-03	2.6E-03
	0-2	ABS-10	6	3	50%	6.0E-03	6.0E-03	5.0E-03
		ABS-14	7	0	0%	6.0E-03	0.0E+00	0.0E+00

Round 1: 8/24/2009 - 8/27/2009

Round 2: 8/31/2009 - 9/03/2009

Round 3: 9/08/2009 - 9/10/2009

Round 4: 9/14/2009 - 9/16/2009

Round 5: 9/21/2009 - 9/24/2009

Round 6: 9/28/2009 - 9/30/2009

Round 7: 10/05/2009 - 10/06/2009

Round 8: 11/09/2009

ABS - activity-based sampling

LA = Libby amphibole

PCME = phase contrast microscopy equivalent

s/cc = structures per cubic centimeter

TABLE 8-2. PHASE IV PART A SUMMARY OF RESULTS FOR ABS PERSONAL AIR

ABS Area	Receptor Type	Script	ABS Scenario Description	N Samples	N Total LA Detects	Total LA Detect. Freq. (%)	Mean Sensitivity (cc) ⁻¹	Mean Conc. (s/cc)	
								Total LA	PCME LA
Rainy Creek	Recreational visitor	1	Hiking along Rainy Creek	10	9	90%	3.9E-03	8.9E-02	2.3E-02
ABS-02 (far)	Residential wood harvester	2A	Driving to and from harvest area	10	0	0%	3.2E-02	0.0E+00	0.0E+00
		2B*	Cutting and hauling firewood	2	0	0%	7.7E-03	0.0E+00	0.0E+00
		2B.1	Felling and limbing	12	2	17%	1.3E-02	1.9E-03	6.2E-04
		2B.2	Cutting and stacking	8	1	13%	1.5E-02	1.4E-03	0.0E+00
	USFS Worker (forest management activities)	3A	Trail maintenance	10	1	10%	1.6E-02	7.5E-04	7.5E-04
		3B	Thinning trees	10	2	20%	1.5E-02	1.5E-03	7.5E-04
		3C	Stand exam	10	0	0%	8.8E-03	0.0E+00	0.0E+00
	USFS Firefighter (ground-based)	3D	Cutting firelines by hand	10	9	90%	9.7E-03	2.6E-02	1.1E-02
		3E	Cutting firelines with heavy equipment	10	8	80%	1.1E-02	3.0E-02	3.9E-03
ABS-07 (middle)	Residential wood harvester	2A	Driving to and from harvest area	10	0	0%	3.5E-02	0.0E+00	0.0E+00
		2B*	Cutting and hauling firewood	2	2	100%	5.7E-03	3.2E-02	1.0E-02
		2B.1	Felling and limbing	10	8	80%	9.2E-03	2.6E-02	7.4E-03
		2B.2	Cutting and stacking	8	4	50%	6.6E-03	7.9E-03	3.5E-03
	USFS Worker (forest management activities)	3A	Trail maintenance	10	4	40%	1.5E-02	4.5E-03	1.5E-03
		3B	Thinning trees	10	4	40%	1.1E-02	3.5E-03	7.5E-04
		3C	Stand exam	10	2	20%	9.0E-03	5.3E-03	1.6E-03
	USFS Firefighter (ground-based)	3D	Cutting firelines by hand	10	8	80%	1.2E-02	7.2E-02	2.7E-02
		3E	Cutting firelines with heavy equipment	10	8	80%	8.8E-03	5.3E-02	7.2E-03
ABS-10 (near)	Residential wood harvester	2A	Driving to and from harvest area	10	0	0%	3.4E-02	0.0E+00	0.0E+00
		2B*	Cutting and hauling firewood	2	2	100%	4.7E-03	1.2E-02	4.7E-03
		2B.1	Felling and limbing	10	4	40%	9.6E-03	3.9E-03	0.0E+00
		2B.2	Cutting and stacking	8	0	0%	1.1E-02	0.0E+00	0.0E+00
	USFS Worker (forest management activities)	3A	Trail maintenance	10	0	0%	1.7E-02	0.0E+00	0.0E+00
		3B	Thinning trees	10	1	10%	1.4E-02	1.5E-03	0.0E+00
		3C	Stand exam	10	0	0%	8.2E-03	0.0E+00	0.0E+00
	USFS Firefighter (ground-based)	3D	Cutting firelines by hand	10	0	0%	1.2E-02	0.0E+00	0.0E+00
		3E	Cutting firelines with heavy equipment	10	5	50%	7.2E-03	1.1E-02	5.2E-03

*After the first round of sampling, this script was split into two parts (2B.1 - felling & limbing; 2B.2 - cutting & stacking) to reduce the potential for filter overloading and need for indirect preparation.

Sample collection dates: July 20, 2010 through August 26, 2010

L = liters

LA = Libby amphibole

s/cc = structures per cubic centimeter

PCME = Phase Contrast Microscopy Equivalent

TABLE 8-3. PHASE V PART A SUMMARY OF ASBESTOS RESULTS FOR ABS PERSONAL AIR - KOOTENAI RECREATIONAL VISITOR

Sample ID	Sampling Date	Sampling Time Interval		Filter Type [HV/LV]	Activity	Sample Air Volume (liters)	GOs Examined	Sensitivity (1/cc)	PCME LA Count	PCME LA Air Conc. (s/cc)
		Start	Stop							
P5-10097	9/19/2010	14:05	15:05	HV	Landing a boat and fishing	243	395	3E-04	0	0E+00
P5-10099	9/19/2010	14:05	15:05	HV	Landing a boat and fishing	241	395	3E-04	0	0E+00

Notes:

ABS = activity based sampling

HV = high volume

LV = low volume

GO = grid opening

cc = cubic centimeters

PCME = phase contrast microscopy-equivalent

LA = Libby amphibole

s/cc = structures per cubic centimeter

TABLE 8-4. COMMERCIAL LOGGING SUMMARY OF ASBESTOS RESULTS FOR ABS AIR

Sample ID	Sampling Date	Sampling Time Interval		Filter Type [HV/LV]	Activity	Location of Pump	Sample Air Volume (liters)	GOs Examined	Sensitivity (1/cc)	PCME LA Count	PCME LA Air Conc. (s/cc)
		Start	Stop								
CL-30050	9/4/2012	9:36	11:36	HV	Hand Felling	Sawyer	485	137	4E-04	2	0.00089
CL-30054	9/4/2012	11:40	13:40	LV	Hand Felling	Sawyer	244	84	1E-03	3	0.0043
CL-30056	9/4/2012	13:56	14:56	LV	Hand Felling	Sawyer	122	145	2E-03	3	0.0050
CL-30057	9/5/2012	8:10	10:10	HV	Skidding/hooking of timber	Skidder operator	482	23	1E-02	27	0.27
CL-30061	9/5/2012	10:25	12:25	LV	Skidding/hooking of timber	Skidder operator	243	36	1E-02	26	0.33
CL-30062	9/5/2012	12:40	12:53	HV	Skidding/hooking of timber	Skidder operator	476	20	1E-02	26	0.30
		13:47	15:34								
CL-30064	9/5/2012	15:40	17:25	HV	Skidding/hooking of timber	Skidder operator	418	18	1E-02	27	0.40
CL-30066	9/6/2012	11:00	13:05	HV	Skidding/hooking of timber	Skidder operator	504	40	1E-03	3	0.0044
CL-30069	9/6/2012	13:25	15:25	HV	Mechanical processing	Skidder operator	481	40	2E-03	1	0.0015
CL-30076	9/10/2012	10:05	11:02	LV	Chipping	10ft from chipper	114.6	291	2E-03	7	0.012
CL-30078	9/10/2012	10:05	11:02	LV	Chipping	30ft from chipper	114.3	279	2E-03	13	0.023
CL-30080	9/10/2012	13:50	14:50	HV	Site restoration	Dozer operator	240	42	6E-03	25	0.14
CL-30082	9/10/2012	13:50	14:50	HV	Site restoration	Helper	238	144	2E-03	15	0.024

Notes:

ABS = activity based sampling

HV = high volume

LV = low volume

GO = grid opening

cc = cubic centimeters

PCME = phase contrast microscopy-equivalent

LA = Libby amphibole

s/cc = structures per cubic centimeter

TABLE 8-5. PHASE III SUMMARY OF ASBESTOS RESULTS FOR SUPPLEMENTAL ANALYSIS OF ABS AIR FOR THE RECREATIONAL VISITOR SCENARIO

ABS Area	Index ID*	Air Volume (L)	Original Analysis (2009)				Supplemental Analysis (2013)				Pooled Sensitivity (cc-1)	Pooled PCME LA Air Conc. (s/cc)
			GOs Counted	Achieved Sensitivity (cc-1)	PCME LA Structures	PCME LA Air Conc. (s/cc)	Add'l GOs counted	Achieved Sensitivity (cc-1)	PCME LA Structures	PCME LA Air Conc. (s/cc)		
ABS-02 (far from mine)	P3-00486	164	39	6.0E-03	0	0	310	5.8E-04	0	0	5.3E-04	0
	P3-00725	320	20	6.0E-03	0	0	160	5.8E-04	0	0	5.3E-04	0
	P3-00800	320	20	6.0E-03	0	0	160	5.8E-04	0	0	5.3E-04	0
	P3-01018	160	40	6.0E-03	0	0	310	6.0E-04	0	0	5.4E-04	0
ABS-07 (intermed. from mine)	P3-00551	320	20	6.0E-03	0	0	160	5.8E-04	0	0	5.3E-04	0
	P3-00645	320	20	6.0E-03	0	0	160	5.8E-04	0	0	5.3E-04	0
	P3-00881	320	20	6.0E-03	0	0	160	5.8E-04	0	0	5.3E-04	0
	P3-01041	320	20	6.0E-03	0	0	160	5.8E-04	0	0	5.3E-04	0
ABS-10 (near mine)	P3-00523	320	20	6.0E-03	0	0	160	5.8E-04	0	0	5.3E-04	0
	P3-00774	320	20	6.0E-03	0	0	160	5.8E-04	0	0	5.3E-04	0
	P3-00825	320	20	6.0E-03	0	0	160	5.8E-04	0	0	5.3E-04	0
	P3-00951	320	20	6.0E-03	0	0	160	5.8E-04	0	0	5.3E-04	0

Notes:

*All samples were selected from the recreational visitor (hiking) ABS scenario

ABS - activity-based sampling

cc - cubic centimeters

Conc. - concentration

GO - grid opening

ID - identification

L - liters

LA - Libby amphibole asbestos

PCME - phase contrast microscopy - equivalent

s/cc - structures per cubic centimeter

TABLE 8-6. PHASE IV PART A, SUMMARY OF ASBESTOS RESULTS FOR SUPPLEMENTAL ANALYSIS OF ABS AIR FOR THE RESIDENTIAL WOOD HARVESTER SCENARIO

ABS Area	ABS Scenario	ABS Script	Index ID	Air Volume (L)	Original Analysis (2010)				Supplemental Analysis (2013)				Pooled Sensitivity (cc-1)	Pooled PCME LA Air Conc. (s/cc)
					GOs Counted	Achieved Sensitivity (cc-1)	PCME LA Structures	PCME LA Air Conc. (s/cc)	Addt'l GOs counted	Achieved Sensitivity (cc-1)	PCME LA Structures	PCME LA Air Conc. (s/cc)		
ABS-02 (far from mine)	Driving to and from harvest area	2A	P4-00003	320	4	3.0E-02	0	0	31	2.9E-03	0	0	2.7E-03	0
		2A	P4-00114	328	4	2.9E-02	0	0	30	2.9E-03	0	0	2.7E-03	0
		2A	P4-00283	248	5	3.1E-02	0	0	40	2.9E-03	0	0	2.7E-03	0
	Cutting and hauling firewood (2B.1 - Felling & limbing; 2B.2 - Cutting & stacking)	2B	P4-00011	50	100	7.7E-03	0	0	141	4.1E-03	0	0	2.7E-03	0
		2B.1	P4-00120	80	100	1.7E-02	0	0	451	2.9E-03	0	0	2.5E-03	0
		2B.2	P4-00126	120	100	1.1E-02	0	0	255	3.4E-03	0	0	2.6E-03	0
		2B.1	P4-00289	80	100	1.7E-02	0	0	451	2.9E-03	0	0	2.5E-03	0
		2B.2	P4-00295	120	100	1.1E-02	0	0	270	3.2E-03	0	0	2.5E-03	0
ABS-07 (intermed. from mine)	Driving to and from harvest area	2A	P4-00043	68	16	3.5E-02	0	0	149	2.9E-03	0	0	2.6E-03	0
		2A	P4-00157	264	4	3.6E-02	0	0	38	2.9E-03	0	0	2.7E-03	0
		2A	P4-00200	120	9	3.6E-02	0	0	83	2.9E-03	0	0	2.7E-03	0
	Cutting and hauling firewood (2B.1 - Felling & limbing; 2B.2 - Cutting & stacking)	2B	P4-00047	200	100	6.7E-03	3	2.0E-02	129	4.0E-03	0	0	2.5E-03	7.6E-03
		2B.1	P4-00163	80	100	5.6E-03	1	5.6E-03	93	4.7E-03	0	0	2.5E-03	2.5E-03
		2B.2	P4-00171	30	100	1.3E-02	0	0	284	3.4E-03	0	0	2.7E-03	0
		2B.1	P4-00205	81	100	5.5E-03	2	1.1E-02	90	4.8E-03	0	0	2.6E-03	5.1E-03
		2B.2	P4-00211	120	79	4.7E-03	0	0	51	5.7E-03	0	0	2.6E-03	0
ABS-10 (near mine)	Driving to and from harvest area	2A	P4-00077	312	4	3.1E-02	0	0	32	2.9E-03	0	0	2.7E-03	0
		2A	P4-00181	303	4	3.2E-02	0	0	33	2.9E-03	0	0	2.7E-03	0
		2A	P4-00241	220	5	3.5E-02	0	0	45	2.9E-03	1	2.9E-03	2.7E-03	2.7E-03
	Cutting and hauling firewood (2B.1 - Felling & limbing; 2B.2 - Cutting & stacking)	2B	P4-00083	200	48	4.7E-03	1	4.7E-03	41	5.7E-03	0	0	2.6E-03	2.6E-03
		2B.1	P4-00187	80	100	1.7E-02	0	0	451	2.9E-03	0	0	2.5E-03	0
		2B.2	P4-00195	30	100	1.3E-02	0	0	284	3.4E-03	0	0	2.7E-03	0
		2B.1	P4-00247	80	100	5.6E-03	0	0	93	4.7E-03	0	0	2.5E-03	0
		2B.2	P4-00253	120	80	4.7E-03	0	0	51	5.7E-03	0	0	2.6E-03	0

Note:

ABS - activity-based sampling

cc - cubic centimeters

Conc. - concentration

GO - grid opening

ID - identification

L - liters

LA - Libby amphibole asbestos

N - number

OU - operable unit

PCME - phase contrast microscopy - equivalent

s/cc - structures per cubic centimeter

TABLE 8-7. PHASE IV PART A, SUMMARY OF ASBESTOS RESULTS FOR SUPPLEMENTAL ANALYSIS OF ABS AIR FOR THE PULASKI DIGGING SCENARIO

ABS Area	Index ID	Air Volume (L)	Original Analysis (2010)				Supplemental Analysis (2013)				Pooled Sensitivity (cc-1)	Pooled PCME LA Air Conc. (s/cc)
			GOs Counted	Achieved Sensitivity (cc-1)	PCME LA Structures	PCME LA Air Conc. (s/cc)	Addt'l GOs counted	Achieved Sensitivity (cc-1)	PCME LA Structures	PCME LA Air Conc. (s/cc)		
ABS-02 (far from mine)	P4-00035	320	100	1.3E-02	2	2.6E-02	79	1.2E-02	0	0	6.3E-03	1.3E-02
	P4-00151	328	100	7.7E-03	1	7.7E-03	19	3.0E-02	1	3.0E-02	6.1E-03	1.2E-02
	P4-00319	248	100	7.7E-03	1	7.7E-03	19	3.0E-02	0	0	6.1E-03	6.1E-03
	P4-00446	50	100	7.7E-03	0	0	19	3.0E-02	0	0	6.1E-03	0
	P4-00593	80	100	7.7E-03	2	1.5E-02	19	3.0E-02	0	0	6.1E-03	1.2E-02
ABS-07 (intermed. from mine)	P4-00072 *	120	100	6.4E-03	2	1.3E-02	--	--	--	--	6.4E-03	1.3E-02
	P4-00237	80	100	2.6E-02	0	0	233	8.3E-03	0	0	6.3E-03	0
	P4-00362	120	100	7.7E-03	4	3.1E-02	19	3.0E-02	4	1.2E-01	6.1E-03	4.9E-02
	P4-00508	68	100	7.7E-03	3	2.3E-02	19	3.0E-02	0	0	6.1E-03	1.8E-02
	P4-00545	264	100	7.7E-03	8	6.2E-02	19	3.0E-02	0	0	6.1E-03	4.9E-02
ABS-10 (near mine)	P4-00110	120	100	1.3E-02	0	0	79	1.2E-02	0	0	6.3E-03	0
	P4-00277 *	200	100	6.4E-03	0	0	--	--	--	--	6.4E-03	0
	P4-00405	80	100	1.3E-02	0	0	79	1.2E-02	0	0	6.3E-03	0
	P4-00637	30	100	2.6E-02	0	0	233	8.3E-03	0	0	6.3E-03	0
	P4-00659 *	81	100	6.4E-03	0	0	--	--	--	--	6.4E-03	0

* Because only 2 GOs were needed to achieve the target analytical sensitivity, supplemental analysis of this sample was not performed.

Note:

ABS - activity-based sampling

cc - cubic centimeters

Conc. - concentration

GO - grid opening

ID - identification

L - liters

LA - Libby amphibole asbestos

N - number

OU - operable unit

PCME - phase contrast microscopy - equivalent

s/cc - structures per cubic centimeter

TABLE 8-8. SUMMARY OF ASBESTOS RESULTS FOR AIR SAMPLES COLLECTED DURING THE SOUSE GULCH WILDFIRE

Sample Type	Index ID	Sample Date	Air Volume (L)	Sensitivity (cc ⁻¹)	PCME LA Structures	PCME LA Air Conc. (s/cc)	
Firefighter ABS, set 1 of 4 early morning	SM-10060	7/27/2013	60	0.0018	0	0	
Firefighter ABS, set 1 of 4 early morning	SM-10061	7/27/2013	60	0.0016	1	0.0016	
Firefighter ABS, set 2 of 4 early morning	SM-10063	7/27/2013	52	0.0018	0	0	
Firefighter ABS, set 2 of 4 early morning	SM-10065	7/27/2013	52	0.0018	0	0	
Firefighter ABS, set 3 of 4 early morning	SM-10064	7/27/2013	60	0.0015	2	0.0031	
Firefighter ABS, set 3 of 4 early morning	SM-10067	7/27/2013	60	0.0017	0	0	
Firefighter ABS, set 4 of 4 early morning	SM-10062	7/27/2013	56	0.0017	0	0	
Firefighter ABS, set 4 of 4 early morning	SM-10066	7/27/2013	56	0.0016	0	0	
Firefighter ABS, set 1 of 4 afternoon	SM-10069	7/27/2013	60	<i>Not Analyzed</i>			
Firefighter ABS, set 1 of 4 afternoon	SM-10072	7/27/2013	60	0.0018	0	0	
Firefighter ABS, set 2 of 4 afternoon	SM-10074	7/27/2013	60	0.0018	0	0	
Firefighter ABS, set 2 of 4 afternoon	SM-10075	7/27/2013	60	0.0018	0	0	
Firefighter ABS, set 3 of 4 afternoon	SM-10070	7/27/2013	56	0.0018	0	0	
Firefighter ABS, set 3 of 4 afternoon	SM-10073	7/27/2013	56	0.0018	0	0	
Firefighter ABS, set 4 of 4 afternoon	SM-10071	7/27/2013	60	0.0018	0	0	
Firefighter ABS, set 4 of 4 afternoon	SM-10076	7/27/2013	60	0.0018	0	0	
Mobile monitor	SM-10068	7/27/2013	482	0.00072	0	0	
Libby Airport Heli	SM-10077	7/27/2013	124	0.0024	0	0	
F1 (McGillivray campground)	SM-10080	7/27/2013	2880	0.00069	0	0	

Note:

ABS = activity-based sampling

cc⁻¹ = per cubic centimeter

Conc. = concentration

ID = identification

L = liters

LA = Libby amphibole asbestos

PCME = phase contrast microscopy - equivalent

s/cc = structures per cubic centimeter

TABLE 8-9. SUMMARY OF ASBESTOS RESULTS FOR ASH COLLECTED FROM SOUSE GULCH WILDFIRE AREA

Index ID	Replicate 1			Replicate 2			Replicate 3			Mean Conc. Across Replicates (Ms/g)
	Sensitivity (1/g)	N Total LA Structures	Conc. (Ms/g)	Sensitivity (1/g)	N Total LA Structures	Conc. (Ms/g)	Sensitivity (1/g)	N Total LA Structures	Conc. (Ms/g)	
SM-20001	9.7E+06	4	3.9E+01	9.2E+06	3	2.8E+01	9.2E+06	7	6.5E+01	44
SM-20002	9.8E+06	5	4.9E+01	9.8E+06	8	7.9E+01	9.8E+06	7	6.9E+01	66
SM-20003	9.2E+06	4	3.7E+01	9.7E+06	5	4.8E+01	9.7E+06	7	6.8E+01	51

Note:

Conc. = concentration

g = grams

ID = identification

LA = Libby amphibole asbestos

Ms/g = million structures per gram

N = number

TABLE 9-1. PHASE II PART A ELEMENT 5 SURFACE WATER TOXICITY TESTING RESULTS OF INITIAL PILOT SCALE STUDY

Sample	N LA Structures	Concentration (MFL)			Poisson Ratio Test ^a	
		Best Est.	LB	UB		
Top 1	52	29.6	22.4	38.5	1 vs 2	[0.91-2.01] The rates are not different
Top 2	55	21.9	16.7	28.3	1 vs 3	[0.89-2.01] The rates are not different
Top 3	50	22.1	16.6	28.9	2 vs 3	[0.66-1.48] The rates are not different
Bottom 1	51	22.6	17.0	29.4	1 vs 2	[0.66-1.5] The rates are not different
Bottom 2	50	22.6	17.0	29.6	1 vs 3	[0.64-1.44] The rates are not different
Bottom 3	53	23.5	17.8	30.4	2 vs 3	[0.64-1.45] The rates are not different
Pooled top	157	24.1	20.5	28.1	top vs bottom	[0.84-1.32] The rates are not different
Pooled bottom	154	22.9	19.5	26.7		

^a Poisson Ratio Test based on 95% confidence interval

LA = Libby amphibole

MFL = million fibers per liter

LB = lower bound

UB = upper bound

TABLE 9-2. PHASE II PART A ELEMENT 5 SURFACE WATER TOXICITY TESTING - LA CONCENTRATIONS AT DAY 0

Cycle	Dilution	Cycle Collection Timing	Index ID	Rapid TAT	Full TEM Analysis								
				Water Conc. (MFL)	Filter Size (mm ²)	Ago (mm ²)	Volume Applied to Filter (mL)	GOs Counted	Sensitivity 1/L	Total LA		LA > 10 µm in length	
Initial Characterization	Undiluted	Pre-test	TOX-PRE-LA-1	29.9	1295	0.013	25	4	1.0E+06	28	27.9	4	4.0
			TOX-PRE-LA-2	27.1	1295	0.013	25	6	6.6E+05	25	16.6	2	1.3
			TOX-PRE-LA-3	29.9	1295	0.013	25	6	6.6E+05	26	17.3	8	5.3
			Pooled	28.8							20.6		

TAT = turn-around time

TEM = transmission electron microscopy

MFL = million fibers per liter

mL = milliliter

L = liter

µm = microns

mm² = square millimeters

GO = grid opening

LA = Libby amphibole

TABLE 9-3. PHASE II PART A ELEMENT 5 SURFACE WATER TOXICITY TESTING - LA CONCENTRATIONS, CYCLES #1 & #7

Cycle	Dilution	Cycle Collection Timing ^[a]	Index ID	Filter Size (mm ²)	Ago (mm ²)	Volume Applied to Filter (mL)	GOs Counted	Sensitivity 1/L	Total LA		LA > 10 µm in length	
									N Structures	Water Conc. (MFL)	N Structures	Water Conc. (MFL)
1 (days 1-10)	1 - 100% (undiluted)	Start	D1-C1-NEW	360	0.013	10	32	8.7E+04	26	2.3	5	0.4
	2 - 10%		D2-C1-NEW	360	0.013	10	50	5.5E+04	0	0.0	0	0.0
	3 - 1%		D3-C1-NEW	360	0.013	10	50	5.5E+04	0	0.0	0	0.0
	4 - 0.1%		D4-C1-NEW	360	0.013	10	50	5.5E+04	0	0.0	0	0.0
	5 - 0.01%		D5-C1-NEW	360	0.013	10	50	5.5E+04	0	0.0	0	0.0
	6 - 0.001%		D6-C1-NEW	360	0.013	10	50	5.5E+04	0	0.0	0	0.0
	7 - 0%		D7-C1-NEW	360	0.013	50	12	4.6E+04	0	0.0	0	0.0
	1 - 100% (undiluted)	End	D1-C1-OLD	360	0.013	50	12	4.6E+04	0	0.0	0	0.0
	2 - 10%		D2-C1-OLD	360	0.013	50	12	4.6E+04	0	0.0	0	0.0
	3 - 1%		D3-C1-OLD	360	0.013	50	12	4.6E+04	0	0.0	0	0.0
	4 - 0.1%		D4-C1-OLD	360	0.013	50	12	4.6E+04	0	0.0	0	0.0
	5 - 0.01%		D5-C1-OLD	360	0.013	50	12	4.6E+04	0	0.0	0	0.0
	6 - 0.001%		D6-C1-OLD	360	0.013	10	50	5.5E+04	0	0.0	0	0.0
	7 - 0%		D7-C1-OLD	360	0.013	50	12	4.6E+04	0	0.0	0	0.0
7 (days 33-35)	1 - 100% (undiluted)	Start	D1-C7-NEW	360	0.013	25	22	5.0E+04	25	1.3	4	0.2
	2 - 10%		D2-C7-NEW	360	0.013	10	50	5.5E+04	1	0.06	0	0.0
	3 - 1%		D3-C7-NEW	360	0.013	50	12	4.6E+04	0	0.0	0	0.0
	4 - 0.1%		D4-C7-NEW	360	0.013	50	12	4.6E+04	0	0.0	0	0.0
	5 - 0.01%		D5-C7-NEW	360	0.013	50	12	4.6E+04	0	0.0	0	0.0
	6 - 0.001%		D6-C7-NEW	360	0.013	50	12	4.6E+04	0	0.0	0	0.0
	7 - 0%		D7-C7-NEW	360	0.013	50	12	4.6E+04	0	0.0	0	0.0
	1 - 100% (undiluted)	End	D1-C7-OLD	360	0.013	10	50	5.5E+04	0	0.0	0	0.0
	2 - 10%		D2-C7-OLD									
	3 - 1%		D3-C7-OLD									
	4 - 0.1%		D4-C7-OLD									
	5 - 0.01%		D5-C7-OLD									
	6 - 0.001%		D6-C7-OLD									
	7 - 0%		D7-C7-OLD									

^[a] Cycle collection timing: NEW - sample taken at the start of the cycle; OLD - sample taken near the end of the cycle

^[b] Based on Phase IIA Field Modification #LFM-OU3-10

 Analysis Cancelled

MFL = million fibers per liter

mL = milliliter

L = liter

µm = microns

mm² = square millimeter

GO = grid opening

LA = Libby amphibole

TABLE 9-4. PHASE II PART A ELEMENT 5 SURFACE WATER TOXICITY TESTING - LA CONCENTRATIONS, CYCLES #2 & #4

Cycle	Dilution	Cycle Collection Timing ^[a]	Index ID	Filter Size (mm ²)	Ago (mm ²)	Volume Applied to Filter (mL)	GOs Counted	Sensitivity 1/L	Total LA		LA > 10 µm in length	
									N Structures	Water Conc. (MFL)	N Structures	Water Conc. (MFL)
2 ^[b] (days 11-20)	1 - 100% (undiluted)	Start	TOX-D1-C2-NEW-STEP 1	1295	0.013	40	50	5.0E+04	1	0.05	0	0.0
			TOX-D1-C2-NEW-STEP 2	1295	0.013	40	4	6.2E+05	25	15.6	1	0.6
			TOX-D1-C2-NEW-STEP 3	1295	0.013	20	7	7.1E+05	27	19.2	2	1.4
		Total ^[c]							31.7			
		End	TOX-D1-C2-OLD-STEP 1	1295	0.013	40	50	5.0E+04	0	0.0	0	0.0
			TOX-D1-C2-OLD-STEP 2	1295	0.013	40	50	5.0E+04	1	0.05	0	0.0
			TOX-D1-C2-OLD-STEP 3	1295	0.013	20	50	1.0E+05	0	0.0	0	0.0
		Total ^[c]							0.05			
4 ^[b] (days 24-26)	1 - 100% (undiluted)	Start	TOX-D1-C4-NEW-STEP 1	1295	0.013	40	50	5.0E+04	2	0.1	0	0.0
			TOX-D1-C4-NEW-STEP 2	1295	0.013	40	11	2.3E+05	30	6.8	3	0.7
			TOX-D1-C4-NEW-STEP 3	1295	0.013	20	25	2.0E+05	25	5.0	1	0.2
		Total ^[c]							10.4			
		End	TOX-D1-C4-OLD-STEP 1	1295	0.013	40	50	5.0E+04	0	0.0	0	0.0
			TOX-D1-C4-OLD-STEP 2	1295	0.013	40	50	5.0E+04	1	0.05	1	0.05
			TOX-D1-C4-OLD-STEP 3	1295	0.013	20	50	1.0E+05	0	0.0	0	0.0
		Total ^[c]							0.05			

^[a] Cycle collection timing: NEW - sample taken at the start of the cycle; OLD - sample taken near the end of the cycle

^[b] Based on Phase IIA Field Modification #LFM-OU3-10

^[c] Calculated as: STEP 2 + (STEP 3 - 1/5 * STEP 2)

MFL = million fibers per liter

mL = milliliter

L = liter

µm = microns

mm² = square millimeter

GO = grid opening

LA = Libby amphibole

TABLE 9-5. PHASE II PART A ELEMENT 5 SUMMARY OF FIBER LOSS PILOT STUDY

Analytical Step	Asbestos fibers/liter			
	Cycle 2 new	Cycle 2 old	Cycle 4 new	Cycle 4 old
	Day 10	Day 20	Day 23	Day 26
Step #1	50,000	<50,000	100,000	<50,000
Step #2	16,000,000	50,000	6,800,000	50,000
Step #3	19,000,000	<50,000	5,000,000	<50,000
Step #4	N/D	N/D	N/D	N/D
Total	35,050,000	<50,000	11,900,000	<50,000

Note: Analyzed by ESML. The detection limit was 50,000 fibers per liter.

Samples from cycles 2 and 4 from the highest concentration were used in the pilot washing study.

The Day represents the test day the samples were collected.

Step #4 N/D= Not determined.

TABLE 9-6. PHASE II PART A ELEMENT 5 SUMMARY OF METAL CONCENTRATIONS IN SEDIMENT TOXICITY TEST SAMPLES

Analyte	Sediment Concentration (mg/kg)			
	CC-1	TP-TOE2	BTT-R1	NSY-R1
	P2-01079	P2-01080	P2-01078	P2-01082
Aluminum	10,700	17,600	8,540	7,350
Antimony	2 U	2 U	2 U	2 U
Arsenic	2 U	4.0	5	5
Barium	430	1,160	263	53
Beryllium	5 U	5 U	5 U	5 U
Boron	5 U	5 U	5 U	5 U
Cadmium	1 U	1 U	1 U	1 U
Chromium	91	358	8.0	6.0
Cobalt	16	32	8.0	5.0
Copper	22	34	14	11
Iron	22,000	28,200	18,900	14,000
Lead	7.0	14	12	9.0
Manganese	687	7,670	1,810	267
Mercury	--	--	0.2 U	0.2 U
Nickel	31	66	11	9.0
Selenium	5 U	5 U	5 U	5 U
Silver	1 U	1 U	1 U	1 U
Thallium	0.6 U	0.6 U	0.6 U	0.6 U
Vanadium	39	64	9.0	6.0
Zinc	18	37	42	37

-- = not analyzed

mg/kg = milligrams per kilogram

U = non-detect (practical quantitation limit is reported)

**TABLE 9-7. PHASE II PART A ELEMENT 5 SEDIMENT TOXICITY TESTING - LA
CONCENTRATIONS IN PORE WATER**

Replicate	Porewater Concentration (BFL)							
	Laboratory Reference Sediment		NSY-R1 (Site Reference)		CC-1		TP-TOE2	
	Day 0	Day 28	Day 0	Day 28	Day 0	Day 28	Day 0	Day 28
H	0.0	0.05	0.0	0.0	28.9	3.9	35.9	2.7
I	0.0	0.0	0.0	0.0	3.4	3.9	27.2	3.8
J	0.0	0.0	0.0	0.0	44.8	3.5	20.8	0.8
K	0.0	0.0	0.0	0.0	16.2	3.0	0.0	1.9
L	0.0	0.0	0.0	0.0	0.4	0.4	43.2	4.7

Mean 0.0 0.01 0.0 0.0 18.7 2.9 25.4 2.8

BFL = billion fibers per liter

TABLE 9-8. PHASE V PART B SUMMARY OF ASBESTOS RESULTS FOR SEDIMENT - AMPHIBIAN TOXICITY TEST

Panel A: Pre-Test Results

Station	Lot	Sample Date	Index ID	Libby Amphibole (LA)		Other Amphibole (OA)	Chrysotile (CH)	Stereomicroscopy Examination Sample Appearance	Comments
				Conc (%)	Bin				
CC-1	Lot 1	4/25/2012	CC1-LT1-R1	5	C	ND	ND	greenish-tan, non-fibrous, homogeneous	
		4/25/2012	CC1-LT1-R2	3	C	ND	ND	greenish-tan, non-fibrous, homogeneous	
		4/25/2012	CC1-LT1-R3	2	C	ND	ND	tan, non-fibrous, homogeneous	
		4/25/2012	CC1-LT1-R4	3	C	ND	ND	tan, non-fibrous, homogeneous	
		4/25/2012	CC1-LT1-R5	3	C	ND	ND	tan, non-fibrous, homogeneous	
	Lot 2	4/25/2012	CC1-LT2-R1	3	C	ND	ND	tan, non-fibrous, homogeneous	
		4/25/2012	CC1-LT2-R2	2	C	ND	ND	tan, non-fibrous, homogeneous	
		4/25/2012	CC1-LT2-R3	2	C	ND	ND	tan, non-fibrous, homogeneous	
		4/25/2012	CC1-LT2-R4	1	C	ND	ND	tan, non-fibrous, homogeneous	
		4/25/2012	CC1-LT2-R5	2	C	ND	ND	Brown, non-fibrous, homogenous	[a]
	Lot 3	4/25/2012	CC1-LT3-R1	7	C	ND	ND	Greenish/Black, non-fibrous, homogenous	
		4/25/2012	CC1-LT3-R2	5	C	ND	ND	Greenish/Black, non-fibrous, homogenous	
		4/25/2012	CC1-LT3-R3	7	C	ND	ND	Greenish/Gray, non-fibrous, homogenous	
		4/25/2012	CC1-LT3-R4	7	C	ND	ND	Greenish/Gray, non-fibrous, homogenous	
		4/25/2012	CC1-LT3-R5	4	C	ND	ND	Greenish/Gray, non-fibrous, homogenous	
TP-TOE2	Lot 1	4/25/2012	TPTOE2-LT1-R1	7	C	ND	ND	tan, non-fibrous, homogeneous	
		4/25/2012	TPTOE2-LT1-R2	10	C	ND	ND	tan, non-fibrous, homogeneous	
		4/25/2012	TPTOE2-LT1-R3	4	C	ND	ND	tan, non-fibrous, homogeneous	
		4/25/2012	TPTOE2-LT1-R4	5	C	ND	ND	tan, non-fibrous, homogeneous	
		4/25/2012	TPTOE2-LT1-R5	4	C	ND	ND	tan, non-fibrous, homogeneous	
	Lot 2	4/25/2012	TPTOE2-LT2-R1	2	C	ND	ND	tan, non-fibrous, homogeneous	
		4/25/2012	TPTOE2-LT2-R2	1	C	ND	ND	tan, non-fibrous, homogeneous	
		4/25/2012	TPTOE2-LT2-R3	2	C	ND	ND	tan, non-fibrous, homogeneous	
		4/25/2012	TPTOE2-LT2-R4	2	C	ND	ND	tan, non-fibrous, homogeneous	
		4/25/2012	TPTOE2-LT2-R5	3	C	ND	ND	tan, non-fibrous, homogeneous	
	Lot 3	4/25/2012	TPTOE2-LT3-R1	3	C	ND	ND	tan, non-fibrous, homogeneous	
		4/25/2012	TPTOE2-LT3-R2	3	C	ND	ND	tan, non-fibrous, homogeneous	
		4/25/2012	TPTOE2-LT3-R3	4	C	ND	ND	tan, non-fibrous, homogeneous	
		4/25/2012	TPTOE2-LT3-R4	5	C	ND	ND	tan, non-fibrous, homogeneous	
		4/25/2012	TPTOE2-LT3-R5	4	C	ND	ND	tan, non-fibrous, homogeneous	

[a] Appears to be more like a traditional soil sample, whereas other samples appear to contain little to no soil, but crushed minerals, including diopside, K-feldspar, Quartz, and various micas

Selected for use in the toxicity test

Panel B: Post-Test Results

Station	Sample Type	Sample Date	Index ID	Libby Amphibole (LA)		Other Amphibole (OA)	Chrysotile (CH)	Stereomicroscopy Examination Sample Appearance	Comments
				Conc (%)	Bin				
Control		12/28/2012	469	ND	A	ND	ND	tan, non-fibrous, homogeneous	
Reference		12/28/2012	470	ND	A	ND	ND	tan, non-fibrous, homogeneous	
CC-1, Lot 3	Test Rep A	12/28/2012	471	3	C	ND	ND	greenish-tan, fibrous, homogeneous	
	Test Rep B	12/28/2012	472	2	C	ND	ND	greenish-tan, fibrous, homogeneous	
	Test Rep C	12/28/2012	473	2	C	ND	ND	greenish-tan, fibrous, homogeneous	
	Test Rep D	12/28/2012	474	2	C	ND	ND	greenish-tan, fibrous, homogeneous	

Notes:

Conc (%) = concentration in mass percent

LA = Libby amphibole

PLM-VE = polarized light microscopy-visual estimation

ID = identification

OA = other asbestos

CH = chrysotile

≥ 1% = Bin C

ND = non-detect

TABLE 9-9. PHASE V PART B SUMMARY OF DETECTED CHEMICALS IN SEDIMENT - AMPHIBIAN TOXICITY TEST

Analyte Type	Detected Analyte	Units	Sediment Summary Statistics				
			Number of Samples		Detection Frequency	Mean ^a	Maximum Detected
			Detects	Total			
Metals	Aluminum	mg/kg	2	2	100%	18,450	29,600
	Arsenic	mg/kg	1	2	50%	1.3	2
	Barium	mg/kg	2	2	100%	1,124	1,720
	Chromium	mg/kg	2	2	100%	376	655
	Cobalt	mg/kg	2	2	100%	27	41
	Copper	mg/kg	2	2	100%	39	41
	Iron	mg/kg	2	2	100%	33,700	39,600
	Lead	mg/kg	2	2	100%	20	24
	Magnesium	mg/kg	2	2	100%	34,850	59,500
	Manganese	mg/kg	2	2	100%	1136	1,580
	Nickel	mg/kg	2	2	100%	60	101
	Strontium	mg/kg	2	2	100%	211	316
	Vanadium	mg/kg	2	2	100%	84	89
	Zinc	mg/kg	2	2	100%	36	50
Acid Volatile Sulfide	Acid Volatile Sulfide	mg/kg	0	2	0%	10	20
Nitrogen Compounds	Ammonia as N, KCL Extract	mg/kg	2	2	100%	4	5
Diesel/gasoline range organics	Diesel Range Organics (DRO)	mg/kg	0	2	0%	7	14
Hydrocarbons	Total Extractable Hydrocarbons	mg/kg	2	2	100%	34	36
Sediment/soil quality parameters	Carbon, Organic	wt%	2	2	100%	0.5	0.5
	Moisture	wt%	2	2	100%	29	29
	pH, sat. paste	s.u.	2	2	100%	7.4	7.7

^a Non-detects were evaluated at 1/2 the PQL.

Notes:

C = carbon

PQL = practical quantitation limit

mg/kg = milligram per kilogram

wt% = weight percent

s.u. = standard unit

TABLE 9-10. PHASE V PART B GROWTH AND SURVIVAL ENDPOINTS FOR THE AMPHIBIAN TOXICITY TEST

Endpoint	Treatment 1		Treatment 2		Treatment 3		Stat. Sig.
	Mean	Stdev	Mean	Stdev	Mean	Stdev	
Survival (%)	81.3%	7.2%	61.3%	9.0%	70.0%	8.4%	--
Weight at termination (mg)	354	52	249	33	678	106	a,b
SVL (mm)	17.6	1.4	15.6	1.0	20.8	0.6	a,b
Food intake (g/organism/day)	0.113	0.017	0.130	0.014	0.125	0.010	--

(a) Treatment 3 is statistically different from Treatment 1

(b) Treatment 3 is statistically different from Treatment 2

Notes:

g = grams

mg = milligrams

mm = millimeters

OU = operable unit

Stat. = statistical

Sig. = significance

Stdev = standard deviation

SVL = snout-vent length (body length)

% = percent

Source: Golder (2013a), Appendix E

TABLE 9-11. PHASE V PART B SUMMARY OF ASBESTOS RESULTS FOR SURFACE WATER FOR CAGED FISH STUDY (EGGS)

Sample Date	Sampling Location	Site Locations								Reference Locations						
		LRC-2			LRC-4			LRC-5			NSY			URC-2		
		Index ID	Total LA (MFL)	LA > 10µm (MFL)	Index ID	Total LA (MFL)	LA > 10µm (MFL)	Index ID	Total LA (MFL)	LA > 10µm (MFL)	Index ID	Total LA (MFL)	LA > 10µm (MFL)	Index ID	Total LA (MFL)	LA > 10µm (MFL)
5/10/12	Pore Water (inside Box)	P5-20009	4.6E+02	5.8E+01	P5-20005	8.9E+02	1.7E+02	P5-20001	2.9E+03	4.8E+02	P5-20013	2.1E+01	1.7E+00	P5-20012	2.2E+01	1.8E+00
	Pore Water (outside box)	P5-20010	6.5E+02	8.1E+01	P5-20007	2.7E+03	4.2E+02	P5-20003	2.1E+03	2.8E+02	--	--	--	--	--	--
	Surface Water (outside box)	P5-20011	2.0E+00	4.7E-01	P5-20006	2.3E+01	2.8E+00	P5-20002	4.0E+01	7.6E+00	--	--	--	--	--	--
5/14/12	Pore Water (inside Box)	P5-20020	4.1E+02	6.5E+01	P5-20017	3.4E+03	3.3E+02	P5-20015	9.0E+01	1.6E+00	--	--	--	--	--	--
5/17/12	Pore Water (inside Box)	P5-20032	1.3E+02	1.3E+01	P5-20028	5.5E+02	1.1E+02	P5-20024	3.4E+02	1.1E+02	P5-20037	3.5E-01	1.0E-01	P5-20036	3.7E+00	9.5E-01
	Pore Water (outside box)	P5-20033	2.4E+02	1.3E+01	P5-20029	1.7E+03	2.6E+02	P5-20025	5.2E+02	1.6E+02	--	--	--	--	--	--
	Surface Water (outside box)	P5-20034	4.9E+01	5.7E+00	P5-20030	1.0E+01	2.7E+00	P5-20026	1.3E+01	1.9E+00	--	--	--	--	--	--
5/21/12	Pore Water (inside Box)	P5-20043	2.4E+02	2.0E+01	P5-20041	3.0E+03	4.0E+02	P5-20039	7.1E+01	1.3E+01	--	--	--	--	--	--
5/24/12	Pore Water (inside Box)	P5-20058	1.9E+01	2.1E+00	P5-20056	4.0E+01	6.0E+00	P5-20054	7.1E+01	1.5E+01	P5-20060	0.0E+00	0.0E+00	P5-20059	6.6E+00	2.7E-01
5/28/12	Pore Water (inside Box)	P5-20074	1.3E+02	3.2E+01	P5-20072	9.8E+01	2.4E+01	P5-20071	7.1E+02	1.6E+02	--	--	--	--	--	--
5/31/12	Pore Water (inside Box)	P5-20082	7.9E+01	3.2E+01	P5-20080	2.3E+01	6.2E+00	P5-20078	3.5E+01	1.1E+01	P5-20084	4.6E-02	4.6E-02	P5-20083	9.2E-02	9.2E-03
6/4/12	Pore Water (inside Box)	P5-20101	1.2E+01	2.4E+00	P5-20099	2.8E+02	8.5E+01	P5-20097	9.3E+01	2.7E+01	--	--	--	--	--	--
6/7/12	Pore Water (inside Box)	P5-20114	5.0E+00	1.4E+00	P5-20112	6.0E+01	1.5E+01	P5-20110	5.1E+01	1.2E+01	P5-20108	0.0E+00	0.0E+00	P5-20109	1.7E+00	2.1E-01
6/12/12	Pore Water (inside Box)	--	--	--	--	--	--	--	--	--	P5-20208	4.3E-02	0.0E+00	P5-20204	8.8E-01	3.2E-01
6/19/12	Pore Water (inside Box)	--	--	--	--	--	--	--	--	--	P5-20214	7.2E-02	0.0E+00	P5-20215	1.8E+00	2.1E-01

Notes:

LA = Libby amphibole

MFL = million fibers per liter

µm = micron

LRC = lower Rainy Creek

URC = upper Rainy Creek

NSY = Noisy Creek tributary

-- = not sampled

TABLE 9-13. PHASE V PART B CONSENSUS DATA FROM FIELD STATIONS FOR DEVELOPMENTAL CONTROLS FOR CAGED FISH STUDY (EGGS)

Date	Replicate 1				Replicate 2				Field Control			
	# eggs		# alevins		# eggs		# alevins		# eggs		# alevins	
	alive	dead	alive	dead	alive	dead	alive	dead	alive	dead	alive	dead
5/9/2012	30	0	---	---	30	0	---	---	30	0	---	---
5/10/2012	30	0	---	---	30	0	---	---	30	0	---	---
5/11/2012	27	3	---	---	27	3	---	---	27	3	---	---
5/13/2012	27	0	---	---	26	1	---	---	26	1	---	---
5/16/2012	13	3	11	0	13	6	7	0	21	0	5	0
5/18/2012	6	9	9	0	2	10	8	0	7	2	17	0
5/21/2012	1	2	12	0	---	2	8	0	---	7	17	0
5/23/2012	---	---	13	0	---	---	8	0	---	---	17	0
5/25/2012	---	---	13	0	---	---	8	0	---	---	17	0
5/28/2012	---	---	13	0	---	---	8	0	---	---	16	1
5/30/2012	---	---	13	0	---	---	8	0	---	---	15	1
6/4/2012	---	---	13	0	---	---	8	0	---	---	15	0
6/6/2012	---	---	13	0	---	---	8	0	---	---	14	1
6/9/2012	---	---	13	0	---	---	7	1	---	---	14	0
6/14/2012	---	---	13	0	---	---	6	1	---	---	11	3
6/18/2012	---	---	13	0	---	---	5	1	---	---	11	0
6/20/2012	---	---	13	0	---	---	5	0	---	---	11	0
6/22/2012	---	---	---	---	---	---	---	---	---	---	---	---

Parameter	R1	R2	FC	Total
Dead Eggs	17	22	13	52
Dead Alevins	0	3	6	9
Alive (last day)	13	5	11	29

Notes:

= number

--- = no data

Source: Golder (2013b), Section 2.7 & Appendix E

TABLE 9-14. PHASE V PART B (2013) SUMMARY OF ASBESTOS RESULTS FOR SURFACE WATER - CAGED FISH STUDY (EGGS)

Panel A: Site Locations

Sample Date	LRC-2						LRC-4						LRC-5					
	Pore Water			Surface Water			Pore Water			Surface Water			Pore Water			Surface Water		
	Index ID	Total LA (MFL)	LA > 10µm (MFL)	Index ID	Total LA (MFL)	LA > 10µm (MFL)	Index ID	Total LA (MFL)	LA > 10µm (MFL)	Index ID	Total LA (MFL)	LA > 10µm (MFL)	Index ID	Total LA (MFL)	LA > 10µm (MFL)	Index ID	Total LA (MFL)	LA > 10µm (MFL)
5/6/13	P5-20299	70	12	P5-20297	11	0.4	P5-20295	70	7.5	P5-20294	34	1.2	P5-20292	43	8.3	P5-20290	38	2.8
5/9/13	P5-20310	8.2	0.6	P5-20309	35	2.7	P5-20308	39	9.3	P5-20307	26	3.8	P5-20306	36	9.3	P5-20305	33	9.3
5/13/13	P5-20316	25	7.6	P5-20315	0.4	0.1	P5-20314	33	8.0	P5-20313	26	4.7	P5-20312	36	6.6	P5-20311	18	2.2
5/16/13	P5-20326	54	8.2	P5-20325	2.6	0.5	P5-20324	36	4.0	P5-20323	42	8.3	P5-20322	45	15	P5-20321	39	4.0
5/20/13	P5-20332	56	12	P5-20331	9.2	2.2	P5-20330	36	5.3	P5-20329	35	6.6	P5-20328	43	1.7	P5-20327*	28	3.3
5/23/13	P5-20342	48	10	P5-20341	5.9	0.7	P5-20340	53	8.3	P5-20339	35	5.3	P5-20338	56	15	P5-20337	40	5.3
5/27/13	P5-20348	50	20	P5-20347	7.5	0.6	P5-20346	33	5.3	P5-20345	33	8.0	P5-20344	37	1.3	P5-20343	7.2	1.2
5/30/13	P5-20361	16	1.9	P5-20360	0.1	0	P5-20357	36	2.8	P5-20356	18	6.4	P5-20354	36	4.3	P5-20353	31	5.0

Panel B: Reference Locations

Sample Date	NSY						URC-2						Negative Control					
	Pore Water			Surface Water			Pore Water			Surface Water			Surface Water			Surface Water		
	Index ID	Total LA (MFL)	LA > 10µm (MFL)	Index ID	Total LA (MFL)	LA > 10µm (MFL)	Index ID	Total LA (MFL)	LA > 10µm (MFL)	Index ID	Total LA (MFL)	LA > 10µm (MFL)	Index ID	Total LA (MFL)	LA > 10µm (MFL)	Index ID	Total LA (MFL)	LA > 10µm (MFL)
5/6/13	P5-20303	0.12	0	P5-20302	0	0	P5-20301	0.7	0	P5-20300	0	0	P5-20304	0	0	--	--	--
5/13/13	P5-20320	0	0	P5-20319	0	0	P5-20318	0.2	0.08	P5-20317	0.1	0	--	--	--	--	--	--
5/20/13	P5-20336	0.08	0.08	P5-20335	0	0	P5-20334	0.3	0.13	P5-20333	0	0	--	--	--	--	--	--
5/27/13	P5-20352	0	0	P5-20351	0	0	P5-20350	0	0	P5-20349	0	0	--	--	--	--	--	--
6/3/13	P5-20365	0	0	P5-20364	0	0	P5-20363	0	0	P5-20362	0	0	--	--	--	--	--	--
6/4/13	--	--	--	--	--	--	--	--	--	--	--	--	P5-20366	0	0	--	--	--
6/10/13	P5-20368	0	0	P5-20367	0	0	P5-20370	0	0	P5-20369	0	0	--	--	--	--	--	--
6/17/13	P5-20373	0	0	P5-20374	0	0	P5-20371	0.12	0	P5-20372	0	0	--	--	--	--	--	--

*Failed Chi-square for filter loading evenness

Note:

ID - identification

LA - Libby amphibole asbestos

LRC - lower Rainy Creek

MFL - million fibers per liter

NSY - Noisy Creek

URC - upper Rainy Creek

µm - microns

-- not sampled

> greater than

TABLE 9-15. 2013 REPEAT OF 2012 PHASE V PART B CAGED FISH STUDY (EGGS), WEEKLY DATA SUMMARY FROM FIELD STATIONS

Date	Developmental Stage	Condition	LRC-2		LRC-4		LRC-5		URC-2			NSY			NC (+1 day)		
			Box 1 (RD)	Box 2 (YL)	Box 3 (GN)	Box 1 (RD)	Box 2 (YL)	Box 3 (GN)	1	2	3 (FB)						
5/6/2013	Eyed Eggs	# Alive	28	27	29	28	29	27	26	27	28	28	27	30	29	28	28
		# Dead	2	3	1	2	1	3	4	3	2	2	3	0	1	2	2
		# Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Alevins	# Alive	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		# Dead	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		# Missing	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
5/9/2013	Eyed Eggs	# Alive	7	11	18	7	10	11	25	26	26	28	26	30	22	25	23
		# Dead	5	6	0	4	9	7	0	1	2	0	1	0	4	2	2
		# Missing	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
	Alevins	# Alive	16	10	11	16	10	9	--	--	--	--	--	--	3	1	3
		# Dead	0	0	0	1	0	0	--	--	--	--	--	--	0	0	0
		# Missing	0	0	0	0	0	0	--	--	--	--	--	--	0	0	0
5/13/2013	Eyed Eggs	# Alive	0	0	0	0	0	0	21	26	23	26	21	29	0	0	0
		# Dead	1	0	5	3	4	2	3	0	1	1	4	1	2	5	3
		# Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Alevins	# Alive	20	21	22	18	14	16	1	0	1	1	1	0	21	21	21
		# Dead	2	0	2	2	2	2	0	0	1	0	0	0	2	0	2
		# Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5/16/2013	Eyed Eggs	# Alive	0	0	0	0	0	0	11	22	18	25	19	24	0	0	0
		# Dead	0	0	0	0	0	0	4	1	0	0	1	3	0	0	0
		# Missing	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
	Alevins	# Alive	20	21	21	18	14	16	7	3	4	2	2	2	21	21	21
		# Dead	0	0	1	0	0	0	1	0	2	0	0	0	0	0	0
		# Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5/20/2013	Eyed Eggs	# Alive	0	0	0	0	0	0	0	1	0	1	2	3	0	0	0
		# Dead	0	0	0	0	0	0	2	0	1	0	2	1	0	0	0
		# Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Alevins	# Alive	20	21	21	17	14	16	14	22	21	26	17	22	21	20	21
		# Dead	0	0	0	1	0	0	2	2	0	0	0	0	0	1	0
		# Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5/23/2013	Eyed Eggs	# Alive	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		# Dead	0	0	0	0	0	0	0	1	0	0	2	1	0	0	0
		# Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Alevins	# Alive	20	21	21	17	14	15	14	22	21	27	17	24	21	20	21
		# Dead	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
		# Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5/27/2013	Eyed Eggs	# Alive	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		# Dead	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		# Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Alevins	# Alive	20	21	21	17	14	15	14	22	21	26	17	24	21	20	21
		# Dead	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
		# Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TABLE 9-15. 2013 REPEAT OF 2012 PHASE V PART B CAGED FISH STUDY (EGGS), WEEKLY DATA SUMMARY FROM FIELD STATIONS

Date	Developmental Stage	Condition	LRC-2		LRC-4		LRC-5		URC-2			NSY			NC (+1 day)		
			Box 1 (RD)	Box 2 (YL)	Box 3 (GN)	Box 1 (RD)	Box 2 (YL)	Box 3 (GN)	1	2	3 (FB)						
5/30/2013	Eyed Eggs	# Alive	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		# Dead	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		# Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Alevins	# Alive	20	21	21	16	14	15	14	22	21	26	17	24	21	20	21
		# Dead	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
		# Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6/3/2013	Eyed Eggs	# Alive	--	--	--	--	--	--	0	0	0	0	0	0	0	0	0
		# Dead	--	--	--	--	--	--	0	0	0	0	0	0	0	0	0
		# Missing	--	--	--	--	--	--	0	0	0	0	0	0	0	0	0
	Alevins	# Alive	--	--	--	--	--	--	14	22	21	25	17	24	21	20	21
		# Dead	--	--	--	--	--	--	0	0	0	1	0	0	0	0	0
		# Missing	--	--	--	--	--	--	0	0	0	0	0	0	0	0	0
6/6/2013	Eyed Eggs	# Alive	--	--	--	--	--	--	0	0	0	0	0	0	--	--	--
		# Dead	--	--	--	--	--	--	0	0	0	0	0	0	--	--	--
		# Missing	--	--	--	--	--	--	0	0	0	0	0	0	--	--	--
	Alevins	# Alive	--	--	--	--	--	--	13	22	21	25	17	24	--	--	--
		# Dead	--	--	--	--	--	--	1	0	0	0	0	0	--	--	--
		# Missing	--	--	--	--	--	--	0	0	0	0	0	0	--	--	--
6/10/2013	Eyed Eggs	# Alive	--	--	--	--	--	--	0	0	0	0	0	0	--	--	--
		# Dead	--	--	--	--	--	--	0	0	0	0	0	0	--	--	--
		# Missing	--	--	--	--	--	--	0	0	0	0	0	0	--	--	--
	Alevins	# Alive	--	--	--	--	--	--	13	22	21	25	17	24	--	--	--
		# Dead	--	--	--	--	--	--	0	0	0	0	0	0	--	--	--
		# Missing	--	--	--	--	--	--	0	0	0	0	0	0	--	--	--
6/13/2013	Eyed Eggs	# Alive	--	--	--	--	--	--	0	0	0	0	0	0	--	--	--
		# Dead	--	--	--	--	--	--	0	0	0	0	0	0	--	--	--
		# Missing	--	--	--	--	--	--	0	0	0	0	0	0	--	--	--
	Alevins	# Alive	--	--	--	--	--	--	13	22	21	24	17	24	--	--	--
		# Dead	--	--	--	--	--	--	0	0	0	1	0	0	--	--	--
		# Missing	--	--	--	--	--	--	0	0	0	0	0	0	--	--	--
6/15/2013	Eyed Eggs	# Alive	--	--	--	--	--	--	0	0	0	0	0	0	--	--	--
		# Dead	--	--	--	--	--	--	0	0	0	0	0	0	--	--	--
		# Missing	--	--	--	--	--	--	0	0	0	0	0	0	--	--	--
	Alevins	# Alive	--	--	--	--	--	--	13	22	21	24	17	24	--	--	--
		# Dead	--	--	--	--	--	--	0	0	0	1	0	0	--	--	--
		# Missing	--	--	--	--	--	--	0	0	0	0	0	0	--	--	--
6/17/2013	Eyed Eggs	# Alive	--	--	--	--	--	--	0	0	0	0	0	0	--	--	--
		# Dead	--	--	--	--	--	--	0	0	0	0	0	0	--	--	--
		# Missing	--	--	--	--	--	--	0	0	0	0	0	0	--	--	--
	Alevins	# Alive	--	--	--	--	--	--	13	22	21	24	17	24	--	--	--
		# Dead	--	--	--	--	--	--	0	0	0	0	0	0	--	--	--
		# Missing	--	--	--	--	--	--	0	0	0	0	0	0	--	--	--
6/19/2013	Eyed Eggs	# Alive	--	--	--	--	--	--	0	0	0	--	--	--	--	--	--
		# Dead	--	--	--	--	--	--	0	0	0	--	--	--	--	--	--
		# Missing	--	--	--	--	--	--	0	0	0	--	--	--	--	--	--
	Alevins	# Alive	--	--	--	--	--	--	13	22	21	--	--	--	--	--	--
		# Dead	--	--	--	--	--	--	0	0	0	--	--	--	--	--	--
		# Missing	--	--	--	--	--	--	0	0	0	--	--	--	--	--	--

Notes:

1. LRC = Lower Rainy Creek (Site), URC = Upper Rainy Creek, NSY = Noisy Creek, NC= Negative Control

TABLE 9-16. 2013 REPEAT OF 2012 PHASE V PART B CAGED FISH STUDY (EGGS), STUDY RESULTS

Metric			LRC-2		LRC-4		LRC-5		URC-2			NSY			Negative controls									
			RD	YL	RD	YL	RD	YL	RD	YL	GN	RD	YL	GN	NC-1	NC-2	NC-3							
BY BOX	Number of organisms	Total	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30							
		Dead eggs	8	9	6	9	14	12	12	6	6	3	13	6	7	9	7							
		Dead alevins	2	0	3	5	2	3	4	2	3	3	0	0	2	1	2							
		Missing	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0							
		Alive last day	20	21	21	16	14	15	13	22	21	24	17	24	21	20	21							
		Hatching success (%)	73%	70%	80%	70%	53%	60%	59%	80%	80%	90%	57%	80%	77%	70%	77%							
		Alevin survival (%)	91%	100%	88%	76%	88%	83%	76%	92%	88%	89%	100%	100%	91%	95%	91%							
		Overall survival (%)	67%	70%	70%	53%	47%	50%	45%	73%	70%	80%	57%	80%	70%	67%	70%							
BY STATION	Number of organisms	Total	60		60		60		90			90			90									
		Dead eggs	17		15		26		24			22			23									
		Dead alevins	2		8		5		9			3			5									
		Missing	0		0		0		1			0			0									
		Alive last day	41		37		29		56			65			62									
		Hatching success (%)	72%		75%		57%		73%			76%			74%									
		Alevin survival (%)	95%		82%		85%		85%			96%			93%									
		Overall survival (%)	68%		62%		48%		63%			72%			69%									
BY REACH	Number of organisms	Total	180						180						90									
		Dead eggs	58						46						23									
		Dead alevins	15						12						5									
		Missing	0						1						0									
		Alive last day	107						121						62									
		Hatching success (%)	68%						74%						74%									
		Alevin survival (%)	88%						90%						93%									
		Overall survival (%)	59%						68%						69%									

TABLE 9-17. PHASE V PART B SUMMARY OF ASBESTOS RESULTS FOR SURFACE WATER (INSIDE BOX) FOR CAGED FISH STUDY (FRY)

Sample Date	Site Locations									Reference Locations					
	LRC-2			LRC-4			LRC-5			NSY			URC-2		
	Index ID	Total LA (MFL)	LA > 10µm (MFL)	Index ID	Total LA (MFL)	LA > 10µm (MFL)	Index ID	Total LA (MFL)	LA > 10µm (MFL)	Index ID	Total LA (MFL)	LA > 10µm (MFL)	Index ID	Total LA (MFL)	LA > 10µm (MFL)
5/14/12	P5-20018	0.0E+00	0.0E+00	P5-20016	3.8E+01	1.6E+00	P5-20014	5.9E+01	6.5E+00	P5-20023	0.0E+00	0.0E+00	P5-20021	1.3E+01	1.5E+00
5/17/12	P5-20035	2.6E+00	1.0E-01	P5-20031	1.0E+01	4.2E+00	P5-20027	4.9E+01	1.3E+01	--	--	--	--	--	--
5/21/12	P5-20042	3.4E+01	7.0E+00	P5-20040	5.8E+01	6.0E+00	P5-20038	5.5E+01	9.0E+00	P5-20045	1.0E-01	5.2E-02	P5-20044	6.7E-01	0.0E+00
5/24/12	P5-20057	9.6E+00	1.3E+00	P5-20055	9.6E+00	2.7E+00	P5-20053	1.2E+01	1.2E+00	--	--	--	--	--	--
5/28/12	P5-20073	8.3E+00	1.7E+00	P5-20070	1.7E+01	4.2E+00	P5-20069	2.2E+01	5.3E+00	P5-20076	0.0E+00	0.0E+00	P5-20075	9.0E-01	6.9E-02
5/31/12	P5-20081	8.7E+00	3.1E+00	P5-20079	5.5E+00	6.6E-01	P5-20077	7.5E+00	1.7E+00	--	--	--	--	--	--
6/4/12	P5-20100	5.2E+00	2.0E-01	P5-20098	1.2E+01	1.8E+00	P5-20096	4.2E+01	8.0E+00	P5-20094	0.0E+00	0.0E+00	P5-20095	0.0E+00	0.0E+00
6/7/12	P5-20115	1.0E+01	4.2E+00	P5-20113	5.3E+00	9.5E-01	P5-20111	5.5E+00	1.3E+00	--	--	--	--	--	--
6/11/12	P5-20205	4.9E+00	1.6E+00	P5-20203	9.0E+00	1.0E+00	P5-20201	1.0E+01	2.8E+00	P5-20210	0.0E+00	0.0E+00	P5-20209	0.0E+00	0.0E+00

Notes:

LA = Libby amphibole

MFL = million fibers per liter

µm = micron

LRC = lower Rainy Creek

URC = upper Rainy Creek

NSY = Noisy Creek tributary

-- = not sampled

TABLE 9-18. PHASE V PART B SUMMARY OF SURVIVAL OF CAGED TROUT (JUVENILE TROUT)

Location	Station	WVB	Number Alive	Number Dead	Percent Survival (%)	
Site Locations	LRC-2	Box 1 (RD)	15	0	100	
		Box 2 (YL)	15	0	100	
	LRC-4	Box 1 (RD)	15	0	100	
		Box 2 (YL)	15	0	100	
	LRC-5	Box 1 (RD)	15	0	100	
		Box 2 (YL)	15	0	100	
Reference Locations	URC-2	Box 1 (RD)	13	2	87	
		Box 2 (YL)	15	0	100	
		Box 3 (GN)	15	0	100	
	NSY	Box 1 (RD)	14	1	93	
		Box 2 (YL)	14	1	93	
		Box 3 (GN)	13	2	87	
Total Reference			84	6	93	
Total Site			90	0	100	

Notes:

LRC = lower Rainy Creek

NSY = Noisy Creek

URC = upper Rainy Creek

GN = green

RD = red

YL = yellow

WVB = Whitlock-Vibert box

% = percent

Source: Golder (2013b), Table 18

TABLE 9-19. PHASE V PART B COMPARISON OF LENGTHS AND WEIGHTS FOR SURVIVING SITE AND REFERENCE CREEK TROUT

Location	Station	Number of Surviving Trout	Average Weight (grams)	Site vs. Reference Weight	Average Length (mm)	Site vs. Reference Length
Site Locations	LRC-2	45	26.5	Site > Reference (p<0.01)	147	Site > Reference (p<0.01)
	LRC-4	45	26		143	
	LRC-5	45	19.4		134	
Reference Locations	URC-2	43	21		134	
	NSY	41	19.5		131	

Differences between Site and Reference tested using WRS test ($\alpha=0.2$)

Trout sizes evaluated only for surviving fish

Notes:

LRC = lower Rainy Creek

NSY = Noisy Creek

URC = upper Rainy Creek

mm = millimeters

WRS = Wilcoxon rank-sum

< = less than

> = greater than

Source: Golder (2013b), Table 19

TABLE 9-20. PHASE V PART B EXTERNAL EXAMINATION COMPARISONS BETWEEN SITE AND REFERENCE CREEK CAGED TROUT

Gross Pathological Measure	Statistical Test	p-value	Significant?	Abnormality Occurrence Results
Presence of skin lesions	Fisher's Exact test	1.00	No	Site not > Reference
Presence of lesions on exterior of mouth	Fisher's Exact test	0.50	No	Site not > Reference
Severity of lesions on exterior of mouth	WRS test	<0.01	Yes	Reference > Site
Presence of lesions on lateral line	Fisher's Exact test	1.00	No	Site not > Reference
Severity of lesions on lateral line	WRS test	0.48	No	No statistical difference
Presence of lesions on gills	Fisher's Exact test	0.98	No	Site not > Reference
Severity of lesions on gills	WRS test	0.42	No	No statistical difference
Presence of notching/fraying of dorsal fin	Fisher's Exact test	<0.01	Yes	Site > Reference
Severity of notching/fraying of dorsal fin	WRS test	<0.01	Yes	Site > Reference
Presence of notching/fraying of pectoral fin	Fisher's Exact test	<0.01	Yes	Site > Reference
Severity of notching/fraying of pectoral fin	WRS test	0.92	No	No statistical difference
Presence of notching/fraying of pelvic fin	Fisher's Exact test	0.50	No	Site not > Reference
Presence of notching/fraying of anal fin	Fisher's Exact test	1.00	No	Site not > Reference
Presence of notching/fraying of caudal fin	Fisher's Exact test	0.97	No	Site not > Reference
Severity of notching/fraying of caudal fin	WRS test	0.50	No	No statistical difference

Significance criteria of $\alpha=0.2$

Severity of notching/fraying of pelvic fin and anal fin not evaluated as abnormalities were not observed in either Site or Reference groups

Bolded values indicate significant p-values

Notes:

< = less than

> = greater than

WRS = Wilcoxon rank-sum

Source: Golder (2013b), Table 21

TABLE 10-1 FISH SAMPLING SUMMARY

Year	Station	Number of Fish								Sampling Reach Attributes			Population Estimate (#/acre)*		
		Minnow Trap Fish	Electroshocking Fish (> 65 mm)				Electroshocking Fish (≤ 65 mm)								
			1st Pass	2nd Pass	3rd Pass	Total*	1st Pass	2nd Pass	3rd Pass	Total*	Length (m)	Average Width (m)	Area (acres)	> 65 mm	≤ 65 mm
2008	BTT-R1	NC	14	8	0	22	4	1	0	5	50	1.5	0.019	1,187	270
	NSY-R1		47	13	9	60	10	13	3	23	70	1.5	0.026	2,312	886
	URC-1A		13	4	0	17	8	13	5	21	33	1.2	0.010	1,737	2,146
	URC-2		8	9	NC	17	12	11	NC	23	50	1.1	0.014	1,251	1,692
	TP-TOE2		13	2	NC	15	0	0	NC	0	72	1.4	0.025	602	0
	LRC-1		4	1	NC	5	0	0	NC	0	60	1.5	0.022	225	0
	LRC-2		10	1	NC	11	0	0	NC	0	45	1.4	0.016	707	0
	LRC-3		6	3	NC	9	0	0	NC	0	42	1.7	0.018	510	0
	LRC-5		6	2	NC	8	0	0	NC	0	60	1.8	0.027	300	0
2009	BTT-R1	1	31	13	4	44	7	1	2	8	60	1.5	0.022	1,978	360
	NSY-R1	2	42	7	5	49	8	9	2	17	70	1.5	0.026	1,889	655
	URC-1A	10	10	20	10	30	6	14	9	20	33	1.2	0.010	3,066	2,044
	URC-2	3	25	12	8	37	27	12	7	39	50	1.1	0.014	2,722	2,870
	TP-TOE2	2	14	6	2	20	9	2	0	11	72	1.4	0.025	803	442
	LRC-1	5	11	2	NC	13	0	0	NC	0	60	1.5	0.022	585	0
	LRC-2	0	10	6	2	16	0	0	0	0	45	1.4	0.016	1,028	0
	LRC-3	0	9	1	NC	10	0	0	NC	0	42	1.7	0.018	567	0
	LRC-5	1	11	4	NC	15	0	0	NC	0	60	1.8	0.027	562	0

* excludes 3rd pass

> = greater than

≤ = less than or equal to

m = meter

MLE = maximum likelihood estimate

mm = millimeter

NC = not collected

TABLE 10-2. BMI COMMUNITY METRICES, BIOLOGICAL CONDITION SCORES, RBP 2008, OU3

Panel A: Calculated Metrics	BTT-R1	NSY-R1	URC-1A	URC-2	TPTOE2	LRC-1	LRC-2	LRC-3	LRC-5
	Reference		Site						
1) Taxa Richness (Number of Taxa)	30	31	29	28	26	23	19	19	15
2) Total Density	2375	1065	1256	707	538	5610	2618	304	5221
3) EPT Index (number of taxa at station)	13	26	21	21	9	7	8	12	10
4) Shannon -Weaver Diversity	3	3	4	3	3	3	3	3	2
5) % Ephemeroptera	22	64	43	34	31	4	3	20	30
6) % Tolerant organisms	17	3	3	4	12	35	21	11	7
7) % Contribution Dominant Taxon	27	60	25	25	31	23	46	50	49
8) % Scrappers	31	61	27	26	0	41	59	12	3
9) % Clingers	64	74	58	61	35	90	89	24	59

Panel B: Biological Condition Score (BCS)*	BTT-R1		NSY-R1		URC-1A		URC-2		TPTOE2		LRC-1		LRC-2		LRC-3		LRC-5	
	%	Score	%	Score	%	Score	%	Score	%	Score	%	Score	%	Score	%	Score	%	Score
1. Taxa Richness (site / reference)	100%	6	100%	6	94%	6	90%	6	87%	6	77%	4	63%	4	63%	4	50%	2
2. Total Density (site / reference)	100%	6	100%	6	118%	6	66%	4	23%	0	236%	6	110%	6	13%	0	220%	6
3. EPT Index (site / reference)	100%	6	100%	6	81%	4	81%	4	69%	0	54%	0	62%	0	92%	6	77%	2
4. Shannon -Weaver Diversity (site / reference)	100%	6	100%	6	135%	6	130%	6	85%	4	90%	6	80%	4	74%	4	60%	2
5. % Ephemeroptera (site / reference)	100%	6	100%	6	67%	6	53%	6	142%	6	18%	0	14%	0	91%	6	136%	6
6. % tolerant organisms (reference / site)	100%	6	100%	6	94%	6	90%	6	144%	6	48%	2	79%	4	158%	6	250%	6
7. % Contribution of Dominant Taxon	27%	4	60%	2	25%	4	25%	4	31%	2	23%	4	46%	2	50%	2	49%	2
8. % scrapers (site / reference)	100%	6	100%	6	44%	4	42%	4	0%	0	132%	6	193%	6	40%	4	11%	0
9. % clingers (site / reference)	100%	6	100%	6	78%	6	82%	6	55%	6	141%	6	139%	6	38%	4	92%	6
Biological Condition Score		52		50		48		46		30		34		32		36		32
Biological Condition Score % Compared to Reference**					96%		92%		58%		65%		62%		69%		62%	
Biological Condition Category					Not impaired		Not impaired		Slightly impaired									

* Biological Condition Scoring Criteria listed in Figure 7-6.

** URC stations compared to NSY; LRC stations compared to BTT.

EPT = Ephemeroptera, Plecoptera, and Trichoptera

RBP = Rapid Bioassessment Protocol

% = percent

TABLE 10-3. BMI COMMUNITY METRICS, BIOLOGICAL CONDITION SCORES, RBP 2009, OU3

Panel A: Calculated Metrics	BTT-R1	NSY-R1	URC-1A	URC-2	TPTOE2	LRC-1	LRC-2	LRC-3	LRC-5
	Reference		Site						
1) Taxa Richness (Number of Taxa)	23	52	26	31	26	22	22	30	24
2) Total Density	2548	4560	1833	276	2825	3782	5236	1745	1771
3) EPT Index (number of taxa at station)	12	26	19	20	8	7	8	12	9
4) Shannon -Weaver Diversity	3	5	3	4	3	3	3	3	3
5) % Ephemeroptera	15	25	44	29	21	11	14	11	16
6) % Tolerant organisms	17	6	4	3	15	18	18	10	13
7) % Contribution Dominant Taxon	26	11	35	16	41	24	46	55	43
8) % Scrapers	25	22	35	16	0	40	55	3	8
9) % Clingers	71	35	66	49	48	91	79	20	66

Panel B: Biological Condition Score (BCS)*	BTT-R1		NSY-R1		URC-1A		URC-2		TPTOE2		LRC-1		LRC-2		LRC-3		LRC-5	
	%	Score	%	Score	%	Score	%	Score	%	Score	%	Score	%	Score	%	Score	%	Score
1. Taxa Richness (site / reference)	100%	6	100%	6	50%	2	60%	2	113%	6	96%	6	96%	6	130%	6	104%	6
2. Total Density (site / reference)	100%	6	100%	6	40%	2	6%	0	111%	6	148%	6	205%	6	68%	4	70%	4
3. EPT Index (site / reference)	100%	6	100%	6	73%	2	77%	2	67%	0	58%	0	67%	0	100%	6	75%	2
4. Shannon -Weaver Diversity (site / reference)	100%	6	100%	6	68%	2	84%	4	76%	4	92%	6	86%	6	83%	4	85%	6
5. % Ephemeroptera (site / reference)	100%	6	100%	6	176%	6	116%	6	140%	6	73%	6	93%	6	73%	6	107%	6
6. % tolerant organisms (reference / site)	100%	6	100%	6	150%	6	200%	6	113%	6	94%	6	94%	6	170%	6	131%	6
7. % Contribution of Dominant Taxon	26%	4	11%	6	35%	2	16%	6	41%	2	24%	4	46%	2	55%	2	43%	2
8. % scrapers (site / reference)	100%	6	100%	6	159%	6	73%	6	0%	0	160%	6	220%	6	12%	0	32%	2
9. % clingers (site / reference)	100%	6	100%	6	189%	6	140%	6	68%	6	128%	6	111%	6	28%	2	93%	6
Biological Condition Score		52		54		34		38		36		46		44		36		40
Biological Condition Score % Compared to Reference**					63%		70%		69%		88%		85%		69%		77%	
Biological Condition Category					Slightly impaired		Slightly impaired		Slightly impaired		Not impaired		Not impaired		Slightly impaired		Slightly impaired	

* Biological Condition Scoring Criteria listed in Figure 7-6.

** URC stations compared to NSY; LRC stations compared to BTT.

BMI - benthic macroinvertebrate

EPT = Ephemeroptera, Plecoptera, and Trichoptera

RBP = Rapid Bioassessment Protocol

% = percent

TABLE 10-4. SCORING METHOD FOR MONTANA DEQ APPROACH

Metric	Biological Condition Scoring Criteria			
	3	2	1	0
1. Taxa Richness (Number of Taxa)	>28	28-24	23-19	<19
2. EPT Index (Number of Taxa/Station)	>19	19-17	16-15	<15
3. HBI Score	<3	3-4	4.01-5	>5
4. % Contribution Dominant Taxa	<25	25-35	35.01-45	>45
5. Collector/Gatherer (% Adundance)	<60	60-70	70.01-80	>80
6. EPT Abundance	>70	70-55.01	55-40	<40
7. Scraper/Shredder (% Adundance)	>55	55-40.01	40-25	<25

% = percent

< = less than

> = greater than

EPT = Ephemeroptera, Plecoptera, and Trichoptera

DEQ = Montana Department of Environmental Quality

HBI = Hilsenhoff Biotic Index

TABLE 10-5. BMI COMMUNITY METRICS, MONTANA DEQ MONTANE TOTAL SCORES, 2008, OU3

Panel A: Metrics

	Reference		Site						
	BTT-R1	NSY-R1	URC-1A	URC-2	TPTOE2	LRC-1	LRC-2	LRC-3	LRC-5
1) Taxa Richness (Number of Taxa)	24	34	10	36	30	20	27	17	20
2) EPT Index (number of taxa at station)	9	26	6	22	11	6	10	10	12
3) HBI Score	4.86	1.30	2.46	1.45	4.51	5.30	5.44	4.07	3.42
4) % Contribution Dominant Taxon	54	27	69	22	35	24	40	34	57
5) Collector Gatherer, % Abundance	11	16	72	21	37	3	10	25	61
6) EPT Abundance	32	91	26	80	44	35	26	59	92
7) Scraper and Shredder, % Abundance	18	64	5	51	15	37	29	35	29

Panel B: Montana DEQ Montane Total Scores

	Reference		Site						
	BTT-R1	NSY-R1	URC-1A	URC-2	TPTOE2	LRC-1	LRC-2	LRC-3	LRC-5
1) Taxa Richness (Number of Taxa)	2	3	0	3	3	1	2	0	1
2) EPT Index (number of taxa at station)	0	3	0	3	0	0	0	0	0
3) HBI Score	1	3	3	3	1	0	0	1	2
4) % Contribution Dominant Taxon	0	2	0	3	1	3	1	2	0
5) Collector Gatherer, % Abundance	3	3	1	3	3	3	3	3	2
6) EPT Abundance	0	3	0	3	1	0	0	2	3
7) Scraper and Shredder, % Abundance	0	3	0	2	0	1	1	1	1
Total Score	6	20	4	20	9	8	7	9	9

*Montana DEQ Montane Total Scores Criterion listed in Table 10-4.

BMI - benthic macroinvertebrate

DEQ = Department of Environmental Quality

EPT = Ephemeroptera, Plecoptera, and Trichoptera

HBI = Hilsenhoff Biotic Index

% = percent

TABLE 10-6. BMI COMMUNITY METRICS, MONTANA DEQ MONTANE TOTAL SCORES, 2009, OU3

Panel A: Metrics

	Reference		Site						
	BTT-R1	NSY-R1	URC-1A	URC-2	TPTOE2	LRC-1	LRC-2	LRC-3	LRC-5
1) Taxa Richness (Number of Taxa)	28	42	40	45	27	16	23	24	32
2) EPT Index (number of taxa at station)	9	29	18	18	10	5	8	13	16
3) HBI Score	4.8	1.8	2.0	1.7	4.5	5.6	5.5	3.6	3.4
4) % Contribution Dominant Taxon	55	26	21	22	62	30	34	45	24
5) Collector Gatherer, % Abundance	8	15	36	22	21	5	10	12	51
6) EPT Abundance	23	83	74	78	32	16	26	83	88
7) Scraper and Shredder, % Abundance	12	57	49	59	13	50	37	57	40

Panel B: Montana DEQ Montane Total Scores

	Reference		Site						
	BTT-R1	NSY-R1	URC-1A	URC-2	TPTOE2	LRC-1	LRC-2	LRC-3	LRC-5
1) Taxa Richness (Number of Taxa)	2	3	3	3	2	0	1	2	3
2) EPT Index (number of taxa at station)	0	3	2	2	0	0	0	0	1
3) HBI Score	1	3	3	3	1	0	0	2	2
4) % Contribution Dominant Taxon	0	2	3	3	0	2	2	1	3
5) Collector Gatherer, % Abundance	3	3	3	3	3	3	3	3	3
6) EPT Abundance	0	3	3	3	0	0	0	3	3
7) Scraper and Shredder, % Abundance	0	3	2	3	0	2	1	3	1
Total Score	6	20	19	20	6	7	7	14	16

*Montana DEQ Montane Total Scores Criterion listed in Table 10-4.

BMI - benthic macroinvertebrate

DEQ = Department of Environmental Quality

EPT = Ephemeroptera, Plecoptera, and Trichoptera

HBI = Hilsenhoff Biotic Index

% = percent

TABLE 10-7. HABITAT QUALITY SCORES, 2008, OU3

Habitat Parameter	Perfect Score	Reference		Site Station						
		BTT-R1	NSY-R1	URC-1A	URC-2	TP-TOE2	LRC-1	LRC-2	LRC-3	LRC-5
Epifaunal Substrate/ Available Cover	20	18	16	18	17	15	13	16	17	16
Embeddedness	20	17	19	17	16	15	16	17	18	16
Velocity/Depth Regime	20	12	12	14	12	13	10	10	17	11
Sediment Deposition	20	15	17	16	13	16	14	16	16	17
Channel Flow Status	20	18	13	18	17	17	17	18	18	17
Channel Alteration	20	18	18	17	16	16	14	14	17	14
Frequency of Riffles (or bends)	20	15	15	14	15	14	14	17	12	14
Bank Stability										
Left Bank	10	9	8	9	9	9	7	9	9	9
Right Bank	10	9	8	9	9	9	7	9	9	8
Vegetative Protection										
Left Bank	10	9	9	9	9	9	8	8	9	9
Right Bank	10	9	9	9	9	9	7	8	9	7
Riparian Vegetative Zone Width										
Left Bank	10	8	9	9	9	8	6	7	9	5
Right Bank	10	9	9	9	9	9	6	7	9	9
HABITAT QUALITY SCORE ^a	200	166	162	168	160	159	139	156	169	152
Percent of Reference ^b					104%	99%	96%	84%	94%	102%
Ranking					optimal	optimal	suboptimal	suboptimal	suboptimal	optimal
										suboptimal

% = percent

NA = Not applicable.

[a] Optimal: 160 – 200, Suboptimal: 110 – 159, Marginal: 60 – 109, Poor: less than 60.

[b] Reference for URC-1A and URC-2 is NSY-R1; reference for TP-TOE2, LRC-1, LRC-2,LRC-3, LRC-5 is BTT-R1.

TABLE 10-8. HABITAT QUALITY SCORES, 2009, OU3

Habitat Parameter	Perfect Score	Reference					Site Station			
		BTT-R1	NSY-R1	URC-1A	URC-2	TP-TOE2	LRC-1	LRC-2	LRC-3	LRC-5
Epifaunal Substrate/ Available Cover	20	15	18	18	16	13	11	14	15	15
Embeddedness	20	18	18	16	13	15	13	13	15	13
Velocity/Depth Regime	20	11	12	14	12	12	9	15	14	11
Sediment Deposition	20	15	18	16	12	16	12	15	13	16
Channel Flow Status	20	18	12	17	14	16	15	17	16	16
Channel Alteration	20	18	18	17	17	13	10	12	15	12
Frequency of Ripples (or bends)	20	16	15	14	15	13	14	17	11	14
Bank Stability	Left Bank	10	8	9	9	6	6	8	8	9
	Right Bank	10	8	9	9	7	6	8	8	7
Vegetative Protection	Left Bank	10	9	9	9	7	7	7	9	9
	Right Bank	10	9	9	9	8	7	7	9	6
Riparian Vegetative Zone Width	Left Bank	10	8	9	9	7	5	5	9	7
	Right Bank	10	8	9	9	7	5	5	9	3
HABITAT QUALITY SCORE ^a	200	161	165	166	153	140	120	143	151	138
Percent of Reference ^b				101%	93%	87%	75%	89%	94%	86%
Ranking					optimal	suboptimal	suboptimal	suboptimal	suboptimal	suboptimal

% = percent

NA = Not applicable.

^[a] Optimal: 160 – 200, Suboptimal: 110 – 159, Marginal: 60 – 109, Poor: less than 60.

^[b] Reference for URC-1A and URC-2 is NSY-R1; reference for TP-TOE2, LRC-1, LRC-2,LRC-3, LRC-5 is BTT-R1.

TABLE 10-9. PHASE IV PART B GPS COORDINATES FOR STREAM REACHES, OU3

Location Type	Station ID	Location Description	Reach Information			GPS Coordinates*			
			Length (m)	Avg. Width (m)	Area (m ²)	Top of Reach		Bottom of Reach	
						Northing	Easting	Northing	Easting
Reference	BTT-R1	Tributary of Bobtail Creek	82	1.26	103	603854	5366416	603856	5366352
	NSY-R1	Noisy Creek, Tributary of Pipe Creek	114	2.02	230	608368	5377877	608350	5377782
OU3	URC-1A	Upper Rainy Creek site	52.4	1.56	82	616731	5367949	616754	5367911
	URC-2	Upper Rainy Creek site	84	2.28	192	616760	5367844	616781	5367796
	TP-TOE2	Downstream of Tailings Impoundment	97.3	1.88	183	616310	5366386	616263	5366326
	LRC-1	Lower Rainy Creek site	85	1.96	167	615995	5365811	615960	5365741
	LRC-2	Lower Rainy Creek site	103	1.68	173	615938	5365739	615863	5365699
	LRC-3	Lower Rainy Creek site	64	1.58	101	615626	5364729	615596	5764706
	LRC-5	Lower Rainy Creek site	66	2.22	147	615064	5364095	615071	5364025

*GPS Coordinate System: UTM Zone 11 North, NAD83 datum, meters

m = meters

m² = square meters

TABLE 10-10. PHASE IV PART B STATISTICAL SUMMARY OF POOL TEMPERATURE DATA FOR STREAM REACHES, OU3

Site ID	Number of Observations	Temperature Summary Statistics (°C)		
		Mean	Minimum	Maximum
NSY-R1	2475	10.5	6.1	14.1
URC-1A	2493	8.4	6	10.4
URC-2	2493	8.6	5.7	10.7
TP-TOE2	2492	9.8	8.8	10.7
BTT-R1	2475	17.4	11.7	22.3
LRC-1	2495	15.1	10.2	20.2
LRC-2	2495	15	10	20
LRC-3	2495	13.8	7.9	17.9
LRC-5	2495	13.4	7.1	17.6

TABLE 10-11. PHASE IV PART B STREAM POOL TEMPERATURE MONITORING RESULTS

Site ID	Month	Number of Temperature Measurements	Temperature Summary Statistics °C		
			Mean	Minimum	Maximum
NSY-R1	June	183	6.4	8.5	10.7
	July	744	7.2	10.4	13.4
	August	744	8.5	12	14.1
	September	720	6.1	9.6	12
	October	84	8	9.1	10.1
BTT-R1	June	184	14.7	16.9	19
	July	744	12.3	18	22.1
	August	744	16.1	19.4	22.3
	September	720	11.7	15.1	18.5
	October	83	12.5	13.4	14.6
URC-1A	June	203	6.6	8.2	9.1
	July	744	7.3	8.8	10.4
	August	744	7.3	8.8	10.3
	September	720	6	7.8	9
	October	82	6.9	7.6	8.2
URC-2	June	203	6.6	8.2	9.3
	July	744	7.3	8.9	10.7
	August	744	7.3	9.1	10.7
	September	720	5.7	8	9.8
	October	82	6.9	7.8	8.9
TP-TOE2	June	202	9.6	9.9	10.4
	July	744	9.5	9.9	10.6
	August	744	9.3	9.8	10.7
	September	720	8.8	9.6	10.6
LRC-1	June	204	11.3	13.5	17.6
	July	744	11.4	15	19.9
	August	744	12.8	16.9	20.2
	September	720	10.2	14	18.2
	October	83	11.4	12.9	14.2
LRC-2	June	204	11.4	13.6	17.3
	July	744	11.6	15.1	19.7
	August	744	12.9	16.8	20
	September	720	10	13.8	17.8
	October	83	11.3	12.5	13.8
LRC-3	June	204	11	13.2	16.4
	July	744	11.2	14.3	17.9
	August	744	11.4	15.2	17.7
	September	720	7.9	12.2	15.1
	October	83	9.9	11.4	12.7
LRC-5	June	204	11	13.2	16.5
	July	744	11	14.2	17.6
	August	744	10.8	14.7	17.2
	September	720	7.1	11.6	14.6

TABLE 10-12. PHASE IV PART B SUMMARY OF STREAM POOL AREA MEASUREMENTS AND CLASSIFICATIONS, OU3

Location Type	Site ID	Location Area (m ²)	Pool Class	Count of Pool by Class	Sum of Pool Area (m ²)	Percent Pool Area
Reference	BTT-R1	103	2	2	3.6	3.5
			3	7	5.5	5.3
	NSY-R1	230	1	1	15.1	6.6
			2	5	61.7	26.8
			3	6	47.8	20.8
OU3	URC-1A	82	2	5	34.3	42.0
			3	4	15.5	19.0
	URC-2	192	2	4	24.4	12.7
			3	7	20.7	10.8
	TP-TOE2	183	2	8	52.6	28.8
			3	6	10.9	6.0
	LRC-1	167	2	3	29.5	17.7
			3	5	24.4	14.6
	LRC-2	173	2	4	44.1	25.5
			3	3	6.3	3.6
	LRC-3	101	2	10	41.9	41.4
			3	1	2.1	2.1
	LRC-5	147	2	5	16.9	11.5
			3	7	8.7	5.9

m² = square meters

TABLE 10-13. PHASE V PART B SUMMARY OF RESIDENT TROUT COLLECTED AND EVALUATED

Location	Station	≤ 65 mm					> 65-100 mm				
		Number Collected	Number Evaluated	Species	Length Range (mm)	Weight Range (grams)	Number Collected	Number Evaluated	Species	Length Range (mm)	Weight Range (grams)
Site Locations	LRC-2	3	2	3 UK	48 - 65	1.3 - 3.2	10	7	5 CB, 4 CT, 1 UK	67 - 85	3.5 - 7.4
	LRC-3	2	2	2 UK	63 - 63	2.6 - 3.0	1	1	1 CT	79	6.0
	LRC-4	0	0	---	---	---	0	0	---	---	---
	LRC-5	0	0	---	---	---	0	0	---	---	---
	TP-TOE2	6	6	6 UK	42 - 63	0.6 - 2.2	3	2	2 CB, 1 CT	69 - 74	2.7 - 3.6
	TOTAL	11	10	11 UK	42 - 65	0.6 - 3.2	14	10	7 CB, 6 CT, 1 UK	67 - 85	2.7 - 7.4
Reference Locations	URC-2	6	5	5 UK, 1 CT	58 - 65	1.4 - 2.6*	11	10	6 CT, 5 CB	68 - 78	2.5 - 3.8
	URC-1A	4	3	3 UK, 1 CT	59 - 65	1.6 - 2.5	2	2	2 CT	80 - 92	4.0 - 6.0
	NSY-R1	9	7	7 UK, 2 CT	56 - 65	1.6 - 3.1	14	13	9 CT, 3 CB, 2 UK	68 - 100	3.3 - 9.0
	TOTAL	19	15	15 UK, 4 CT	56 - 65	1.4 - 3.1	27	25	17 CT, 8 CB, 2 UK	68 - 100	2.5 - 9.0

Notes:

LRC = lower Rainy Creek

NSY = Noisy Creek

URC = upper Rainy Creek

TP = tailings pond

mm = millimeter

CB = cutbow

CT = cutthroat

UK = unknown

RB = rainbow

--- = no fish collected

> = greater than

≤ = less than or equal

*Weight not recorded for two fish.

Source: Golder (2013c), Table 3-1 & Appendix E

TABLE 10-14. PHASE V PART B FREQUENCY AND SEVERITY OF OBSERVED GROSS (EXTERNAL) ABNORMALITIES

Panel A: Frequency of External Abnormalities

Tissue Type	% of Fish with External Abnormalities						Statistically Significant?*	
	Lower Rainy Creek			Reference Streams				
	LRC-2/LRC-3	TP-TOE2	TOTAL	URC	NSY	TOTAL		
Head	0%	0%	0%	0%	0%	0%	No (p-value 1.00)	
Dorsal Fin	8%	25%	15%	20%	35%	28%	No (p-value 0.92)	
Adipose Fin	0%	0%	0%	0%	0%	0%	No (p-value 1.00)	
Pectoral Fin	0%	13%	5%	5%	15%	10%	No (p-value 0.88)	
Pelvic Fin	8%	0%	5%	30%	15%	23%	No (p-value 0.99)	
Anal Fin	0%	0%	0%	20%	10%	15%	No (p-value 1.00)	
Caudal Fin	0%	25%	10%	60%	60%	60%	No (p-value 1.00)	
Skin	0%	50%	20%	10%	15%	3%	No (p-value 0.34)	
Gills	50%	13%	35%	40%	50%	45%	No (p-value 0.85)	

Panel B: Severity of External Abnormalities

Tissue Type	Mean Severity Score		Statistically Significant?**
	Lower Rainy Creek	Reference Streams	
Head	---	---	---
Dorsal Fin	1.0	1.5	No (p-value 0.33)
Adipose Fin	---	---	---
Pectoral Fin	1.0	1.0	No (p-value 1.00)
Pelvic Fin	1.0	1.3	No (p-value 0.62)
Anal Fin	---	---	---
Caudal Fin	1.5	1.4	No (p-value 0.69)
Skin	NR	NR	NR
Gills	NR	NR	NR

Notes:

LRC = lower Rainy Creek

NSY = Noisy Creek

URC = upper Rainy Creek

TP = tailings pond

% = percent

--- = no external abnormalities noted

NR = not reported; severity evaluation could not be performed as only occurrence data were reported.

*Evaluated using one-tailed Fisher's Exact test. Criteria for significance: $\alpha=0.20$

**Evaluated using two-tailed Mann-Whitney U test. Criteria for significance: $\alpha=0.20$

Source: Golder (2013c), Table 3-2, Table 3-3, Table 3-4 and Appendix B

TABLE 10-15. PHASE V PART B FREQUENCY AND SEVERITY OF OBSERVED HISTOLOGICAL ABNORMALITIES

Panel A: Frequency of Abnormalities

Tissue Type	% of Fish with Histological Abnormalities						Statistically Significant?*	
	Site Locations			Reference Locations				
	LRC-2/LRC-3	TP-TOE2	TOTAL	URC	NSY	TOTAL		
Nose Head Skin	0%	0%	0%	20%	0%	10%	No (p-value 1.00)	
Dorsal Head Skin	50%	50%	50%	80%	100%	90%	No (p-value 0.99)	
Lateral Head Skin	100%	100%	100%	100%	100%	100%	No (p-value 1.00)	
Opercula Head Skin	75%	100%	88%	100%	100%	100%	No (p-value 1.00)	
Cranial Line	100%	100%	100%	100%	100%	100%	No (p-value 1.00)	
Cornea	25%	100%	60%	40%	80%	60%	No (p-value 0.65)	
Brain	100%	100%	100%	100%	100%	100%	No (p-value 1.00)	
Gills	100%	100%	100%	100%	100%	100%	No (p-value 1.00)	
Oral Mucosa	100%	100%	100%	100%	100%	100%	No (p-value 1.00)	
Nasal Mucosa	100%	100%	100%	100%	100%	100%	No (p-value 1.00)	
Lateral Trunk Skin	100%	75%	88%	100%	100%	100%	No (p-value 1.00)	
Dorsal Trunk Skin	100%	0%	50%	40%	100%	70%	No (p-value 0.91)	
Ventral Trunk Skin	25%	0%	13%	40%	100%	70%	No (p-value 1.00)	
Lateral Line	100%	25%	63%	60%	100%	80%	No (p-value 0.91)	
Fins	100%	100%	100%	100%	100%	100%	No (p-value 1.00)	
Skeletal Muscle	100%	100%	100%	80%	60%	70%	Yes ¹ (p-value 0.15)	

Panel B: Severity of External Abnormalities

Tissue Type	Mean Severity Score		Statistically Significant?**
	Site Locations	Reference Locations	
Nose Head Skin	---	---	---
Dorsal Head Skin	3.8	4.0	No (p-value 0.47)
Lateral Head Skin	3.1	3.9	Yes ² (p-value 0.14)
Opercula Head Skin	3.1	3.9	Yes ² (p-value 0.14)
Cranial Line	4.6	6.3	Yes ² (p-value 0.04)
Cornea	2.2	2.2	No (p-value 1.00)
Brain	3.4	2.7	No (p-value 0.30)
Gills	5.3	9.2	Yes ² (p-value 0.02)
Oral Mucosa	1.0	1.8	Yes ² (p-value <0.01)
Nasal Mucosa	3.5	4.0	No (p-value 0.46)
Lateral Trunk Skin	2.9	3.9	No (p-value 0.40)
Dorsal Trunk Skin	3.5	4.1	No (p-value 0.70)
Ventral Trunk Skin	4.1	5.0	No (p-value 0.66)
Lateral Line	2.6	3.4	No (p-value 0.36)
Fins	1.8	2.0	No (p-value 0.85)
Skeletal Muscle	2.8	2.4	No (p-value 0.58)

Notes:

LRC = lower Rainy Creek

NSY = Noisy Creek

URC = upper Rainy Creek

TP = tailings pond

% = percent

--- = no histological abnormalities noted

*Evaluated using one-tailed Fisher's Exact test. Criteria for significance: $\alpha=0.20$

**Evaluated using two-tailed Mann-Whitney U test. Criteria for significance: $\alpha=0.20$

¹ Site frequency is higher than reference.

² Reference frequency is higher than site.

TABLE 10-16. PHASE V PART B SUMMARY OF ASBESTOS RESULTS FOR SURFACE WATER - AMPHIBIAN FIELD STUDY

Sampling Date	Site Locations												Reference Locations										
	Carney Creek Pond			Fleetwood Creek Pond			Mill Pond			Tailings Impoundment			Bobtail Pond			Banana Lake			Tepee Pond				
	Index ID	Total LA (MFL)	LA > 10µm (MFL)	Index ID	Total LA (MFL)	LA > 10µm (MFL)	Index ID	Total LA (MFL)	LA > 10µm (MFL)	Index ID	Total LA (MFL)	LA > 10µm (MFL)	Index ID	Total LA (MFL)	LA > 10µm (MFL)	Index ID	Total LA (MFL)	LA > 10µm (MFL)	Index ID	Total LA (MFL)	LA > 10µm (MFL)		
5/24/2012	P5-20061	9.0E+00	2.0E+00	P5-20062	1.5E+01	2.3E+00	P5-20065	2.9E+00	5.1E-01	P5-20064	7.7E+00	1.1E+00	P5-20068	0.0E+00	0.0E+00	P5-20066	8.9E-02	4.4E-02	P5-20067	0.0E+00	0.0E+00		
5/31/2012	P5-20085	2.3E-01	4.6E-02	P5-20088	5.7E+00	6.9E-01	P5-20090	3.7E-01	0.0E+00	P5-20089	5.1E-01	9.2E-02	--	--	--	--	--	--	--	--	--	--	
6/6/2012	P5-20105	7.1E-01	1.8E-01	P5-20106	8.3E+00	1.1E+00	P5-20104	1.1E+01	2.0E+00	P5-20107	2.3E+01	4.6E+00	--	--	--	--	--	--	--	--	--	--	
6/15/2012	P5-20211	9.7E+00	3.5E+00	P5-20212	1.1E+02	2.8E+01	P5-20202	2.8E+00	0.0E+00	P5-20213	4.9E+00	7.9E-01	--	--	--	--	--	--	--	--	--	--	
6/21/2012	P5-20217	4.6E-02	4.6E-02	P5-20218	2.7E+01	2.8E+00	P5-20216	1.6E+01	1.2E+00	P5-20219	5.3E+01	1.9E+01	--	--	--	--	--	--	--	--	--	--	
6/29/2012	P5-20223	0.0E+00	0.0E+00	P5-20222	8.6E+00	1.3E+00	P5-20220	8.3E+00	1.0E+00	P5-20221	0.0E+00	0.0E+00	--	--	--	--	--	--	--	--	--	--	
7/5/2012	P5-20224	6.5E+00	1.2E+00	P5-20225	2.5E+01	1.0E+00	P5-20228	2.6E+00	6.1E-01	P5-20229	3.4E+00	5.5E-01	--	--	--	--	--	--	--	--	--	--	
7/11/2012	P5-20232	1.9E+01	2.1E+00	P5-20233	1.4E+01	5.5E-01	P5-20230	4.9E-01	4.4E-02	P5-20231	7.2E+00	5.5E-01	--	--	--	--	--	--	--	--	--	--	
7/19/2012	P5-20234	2.7E+01	2.8E+00	P5-20235	9.2E-02	0.0E+00	P5-20237	5.2E+01	2.1E+00	P5-20236	4.6E-02	0.0E+00	--	--	--	--	--	--	--	--	--	--	
7/26/2012	P5-20238	1.2E+01	4.6E-01	P5-20239	2.5E+01	2.8E+00	P5-20241	2.6E+00	4.1E-01	P5-20240	1.5E+01	4.6E-01	--	--	--	--	--	--	--	--	--	--	
8/2/2012	P5-20242	1.7E+01	2.3E+00	P5-20243	3.0E+01	9.7E+00	P5-20247	3.0E-01	4.7E-02	P5-20244	5.1E+00	8.2E-01	--	--	--	--	--	--	--	--	--	--	
8/9/2012	P5-20248	2.1E-01	3.5E-02	P5-20249	8.0E+00	1.8E+00	P5-20251	0.0E+00	0.0E+00	P5-20250	0.0E+00	0.0E+00	--	--	--	--	--	--	--	--	--	--	
8/16/2012	P5-20252	1.4E+01	2.2E+00	P5-20253	3.7E+01	5.5E+00	P5-20255	0.0E+00	0.0E+00	P5-20254	9.9E+00	1.2E+00	--	--	--	--	--	--	--	--	--	--	
8/23/2012	P5-20257	3.3E-02	0.0E+00	P5-20256	2.0E+01	4.2E+00	P5-20259	1.4E+00	1.6E-01	P5-20258	1.7E-01	0.0E+00	--	--	--	--	--	--	--	--	--	--	
8/30/2012	P5-20261	3.0E+00	2.3E-01	P5-20260	6.4E+01	6.2E+00	P5-20265	0.0E+00	0.0E+00	P5-20264	0.0E+00	0.0E+00	--	--	--	--	--	--	--	--	--	--	
8/31/2012	--	--	--	--	--	--	--	--	--	--	--	--	P5-20271	0.0E+00	0.0E+00	P5-20272	0.0E+00	0.0E+00	P5-20273	0.0E+00	0.0E+00		

Notes:

LA = Libby amphibole

MFL = million fibers per liter

µm = micron

-- = not sampled

TABLE 10-17. PHASE V PART B SUMMARY OF ASBESTOS RESULTS FOR SEDIMENT - AMPHIBIAN FIELD STUDY

Panel A: Sediment Collected Prior to the Study

Location	Station	Sample Date	Index ID	Libby Amphibole (LA)		Other Amphibole (OA)	Chrysotile (CH)	Stereomicroscopy Examination Sample Appearance	Comments
				PLM-VE Bin	Conc (%)				
Site Locations	Carney Creek Pond	4/27/2012	CCP	C	10	ND	ND	Grayish, non-fibrous, homogenous	
	Fleetwood Creek Pond	4/27/2012	FCP	C	4	ND	ND	Tan, non-fibrous, homogenous	
	Mill Pond	4/27/2012	MP	B2	< 1%	ND	ND	Tan, non-fibrous, homogenous	
	Tailings Pond	4/27/2012	TP	B2	< 1%	ND	ND	Tan, non-fibrous, homogenous	
Reference Locations	Tepee Pond 1 (4 miles up road)	4/28/2012	REF1	A	ND	ND	ND	Tan, non-fibrous, homogenous	
	Tepee Pond 2 (6 miles up road)	4/28/2012	REF2	A	ND	ND	ND	Tan, non-fibrous, homogenous	
	Schrieber Lake	4/28/2012	REF3	A	ND	ND	ND	Brown, fibrous, homogenous	5% Cellulose
	Banana Pond	4/28/2012	REF4	A	ND	ND	ND	Brown, non-fibrous, homogenous	2% Cellulose
	Bobtail 1	4/28/2012	REF5	A	ND	ND	ND	Tan, non-fibrous, homogenous	2% Cellulose
	Bobtail 2	4/28/2012	REF6	A	ND	ND	ND	Tan, fibrous, homogenous	4% Cellulose

Panel B: Sediment Collected During the Study

Location	Station	Sample Date	Index ID	Libby Amphibole (LA)		Other Amphibole (OA)	Chrysotile (CH)	Stereomicroscopy Examination Sample Appearance	Comments
				PLM-VE Bin	Conc (%)				
Round 1: May 2012									
Site Locations	Carney Creek Pond	5/21/2012	P5-20046	C	5	ND	ND	Greenish-grey, homogenous	
	Fleetwood Creek Pond	5/21/2012	P5-20047	C	1.5	ND	ND	Greenish-grey, homogenous	
	Mill Pond	5/23/2012	P5-20048	B2	< 1%	ND	ND	Tan, non-fibrous, homogenous	
	Tailings Pond	5/23/2012	P5-20049	B2	< 1%	ND	ND	Tan, non-fibrous, homogenous	
Reference Locations	Banana Lake	5/23/2012	P5-20051	A	ND	ND	ND	Tan, non-fibrous, homogenous	
	Bobtail Pond	5/23/2012	P5-20050	A	ND	ND	ND	Tan, non-fibrous, homogenous	
	Tepee Pond 1	5/23/2012	P5-20052	A	ND	ND	ND	Tan, non-fibrous, homogenous	
Round 2: September 2012									
Site Locations	Carney Creek Pond	9/7/2012	P5-20280	C	4	ND	ND	Greenish-grey, fibrous, homogeneous	
	Fleetwood Creek Pond	9/7/2012	P5-20282	C	3	ND	ND	Greenish-grey, fibrous, homogeneous	
	Mill Pond	9/7/2012	P5-20284	B1	Tr	ND	ND	Tan, non-fibrous, homogeneous	
	Tailings Pond	9/7/2012	P5-20283	C	1.5	ND	ND	Greenish-grey, non-fibrous, homogeneous	
Reference Locations	Banana Lake	9/7/2012	P5-20285	A	ND	ND	ND	Brown, non-fibrous, homogeneous	
	Bobtail Pond	9/7/2012	P5-20287	A	ND	ND	ND	Brown, non-fibrous, homogeneous	
	Tepee Pond 1	9/7/2012	P5-20286	A	ND	ND	ND	Brown, non-fibrous, homogeneous	

Notes:

<1% = less than 1%

Conc (%) = concentration in mass percent

ID = identification

LA = Libby amphibole

ND = non-detect

PLM-VE = polarized light microscopy-visual estimation

QC = quality control

Tr = trace

TABLE 10-18. PHASE V PART B SUMMARY OF SURFACE WATER TEMPERATURES - AMPHIBIAN FIELD STUDY

Location	Station	Number of Measurements	Minimum Temperature (°C)	Maximum Temperature (°C)	Average Temperature (°C)
Site Locations	Carney Creek Pond	29	8.6	22.1	16.5
	Fleetwood Creek Pond	29	10.6	24.3	18.6
	Mill Pond	26	7.8	23.9	15.5
	Tailings Impoundment	24	5.7	26.2	18
Reference Locations	Bobtail Pond	27	7.1	20.6	14.4
	Banana Lake	26	7.8	24.9	17.6
	Tepee Pond	25	8.1	25.5	19.1

Notes:

°C = degrees Celsius

Source: Golder (2014), Table 3-2

TABLE 10-19. PHASE V PART B SUMMARY OF DETECTED CHEMICALS IN SEDIMENT - AMPHIBIAN FIELD STUDY

Panel A: Site Locations

Analyte Type	Detected Analyte	Units	Sediment Summary Statistics					
			Number of Samples		Detection Frequency	Mean ^a	Maximum Detected	
			Detects	Total				
Metals	Aluminum	mg/kg	4	4	100%	18,225	28,600	
	Antimony	mg/kg	4	4	100%	3.3	5	
	Arsenic	mg/kg	2	4	50%	1.5	3	
	Barium	mg/kg	4	4	100%	966	1,700	
	Chromium	mg/kg	4	4	100%	261	406	
	Cobalt	mg/kg	4	4	100%	25	42	
	Copper	mg/kg	4	4	100%	31	45	
	Iron	mg/kg	4	4	100%	26,475	42,300	
	Lead	mg/kg	4	4	100%	23	37	
	Magnesium	mg/kg	4	4	100%	33,850	53,500	
	Manganese	mg/kg	4	4	100%	432	586	
	Nickel	mg/kg	4	4	100%	55	82	
	Strontium	mg/kg	4	4	100%	185	281	
	Vanadium	mg/kg	4	4	100%	45	63	
	Zinc	mg/kg	4	4	100%	80	219	
	Acid Volatile Sulfide	Acid Volatile Sulfide	mg/kg	2	4	50%	103	203
	Nitrogen Compounds	Ammonia as N, KCL Extract	mg/kg	4	4	100%	6	8
	Diesel/gasoline range organics	Diesel Range Organics (DRO)	mg/kg	3	4	75%	57	131
Hydrocarbons	Total Extractable Hydrocarbons	mg/kg	4	4	100%	174	290	
	Carbon, Organic	wt%	4	4	100%	0.7	1.1	
	Moisture	wt%	4	4	100%	34	41	
Sediment/soil quality parameters	pH, sat. paste	s.u.	4	4	100%	7.0	7.2	

Panel B: Reference Locations

Analyte Type	Detected Analyte	Units	Sediment Summary Statistics					
			Number of Samples		Detection Frequency	Mean ^a	Maximum Detected	
			Detects	Total				
Metals	Aluminum	mg/kg	6	6	100%	25,245	57,700	
	Arsenic	mg/kg	6	6	100%	3.7	5	
	Barium	mg/kg	6	6	100%	813	3,210	
	Chromium	mg/kg	6	6	100%	150	642	
	Cobalt	mg/kg	6	6	100%	22	85	
	Copper	mg/kg	6	6	100%	35	87	
	Iron	mg/kg	6	6	100%	30,317	86,000	
	Lead	mg/kg	6	6	100%	28	78	
	Magnesium	mg/kg	6	6	100%	25,790	109,000	
	Manganese	mg/kg	6	6	100%	415	1,220	
	Nickel	mg/kg	6	6	100%	43	167	
	Selenium	mg/kg	2	6	33%	0.8	2	
	Strontium	mg/kg	6	6	100%	154	581	
	Tin	mg/kg	2	6	33%	1.8	5	
	Vanadium	mg/kg	6	6	100%	42	121	
	Zinc	mg/kg	6	6	100%	120	450	
	Acid Volatile Sulfide	Acid Volatile Sulfide	mg/kg	1	6	17%	98	524
	Nitrogen Compounds	Ammonia as N, KCL Extract	mg/kg	6	6	100%	16	57
	Diesel/gasoline range organics	Diesel Range Organics (DRO)	mg/kg	6	6	100%	85	160
Hydrocarbons	Total Extractable Hydrocarbons	mg/kg	6	6	100%	332	650	
	Carbon, Organic	wt%	6	6	100%	2.9	4.2	
	Moisture	wt%	6	6	100%	57	71	
Sediment/soil quality parameters	pH, sat. paste	s.u.	6	6	100%	6.4	6.9	

^a Non-detects were evaluated at 1/2 the PQL.

Notes:

C = carbon

PQL = practical quantitation limit

mg/kg = milligram per kilogram

wt% = weight percent

s.u. = standard unit

TABLE 10-20. PHASE V PART B SUMMARY OF SPECIMENS COLLECTED - AMPHIBIAN FIELD STUDY

Species	Life Stage (target number of specimens)	Site Location*			Reference Location		
		Carney Creek Pond	Fleetwood Creek Pond	Tailings Impoundment	Bobtail Pond	Banana Lake	Tepee Pond
Tree Frog	Egg (n=4)	4	0	0	0	0	0
	Premetamorphs (n=40)	35	40	77	0	36	40
	Prometamorphs (n=40)	11	40	41	0	1	13
	Metamorphs (n=20)	2	20	1	6	0	15
Spotted Frog	Egg (n=4)	0	0	0	0	0	0
	Premetamorphs (n=40)	66	0	6	41	4	40
	Prometamorphs (n=40)	13	0	10	9	9	40
	Metamorphs (n=20)	20	1	20	20	20	20
Western Toad	Egg (n=4)	0	0	0	0	0	0
	Premetamorphs (n=40)	30	0	40	0	0	1
	Prometamorphs (n=40)	0	0	0	0	0	0
	Metamorphs (n=20)	0	0	0	0	0	0
Total Amphibians Collected		181	101	195	76	70	169

*No specimens were collected from the Mill Pond

Source: Golder (2014), Table 3-1

TABLE 11-1. SUMMARY OF SMALL MAMMAL LOCATIONS EVALUATED IN 2009

Location	Trap Line Location Code	Location Descriptor	UTM N	UTM W
Reference Area	SM-R-A	Transect A	5369886	609214
	SM-R-B	Transect B	5368638	607891
	SM-R-C	Transect C	5368078	608732
	SM-R-D	Transect D	5369981	609145
OU3	SM-S-A	Transect A	5367288	618990
	SM-S-B	Transect B	5367601	618592
	SM-S-C	Transect C	5367882	618542
	SM-S-D	Transect D	5367611	617632
	SM-S-E	Transect E	5366776	619492
	SM-S-F	Transect F	5367198	618391

UTM NAD83, Zone 11

TABLE 11-2. SUMMARY OF SMALL MAMMAL CAPTURE COUNTS BY LOCATION AND TRANSECT

Transect Sampled	Species Collected ^a	Count
Reference Area		
Transect A	Deer Mouse	23
	Yellow-Pine Chipmunk	5
Transect B	Yellow-Pine Chipmunk	2
	Deer Mouse	1
Transect C	Bushy-tailed Woodrat	1
	Deer Mouse	5
	Yellow-Pine Chipmunk	1
Transect D	Bushy-tailed Woodrat	1
	Deer Mouse	5
Yellow-Pine Chipmunk		2
OU3		
Transect A	Deer Mouse	15
	Yellow-Pine Chipmunk	7
	Western Jumping Mouse	1
Transect B	Deer Mouse	5
Transect C	Deer Mouse	5 ^b
	Bushy-tailed Woodrat	1
Transect D	Deer Mouse	7
Transect E	Deer Mouse	2
	Yellow-Pine Chipmunk	2
Transect F	Deer Mouse	5
	Yellow-Pine Chipmunk	1

^a The target species was the deer mouse; non-target species were released.

^b Only four of these animals were submitted for necropsy. One animal escaped.